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Physical training in boxing

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Annotation
In this case, the boxer will focus his attention on the preparatory stage of the start of the movement. In this case, the motor centers of the cerebral cortex are excited and are in the starting state. Excitation reaches the motor area of the cerebral cortex and meets there already prepared nervous formulas of response movement, and the corresponding motor impulses instantly rush to the organs of movement.

Keywords
Boxing, preparation, latent time, speed of a single movement, frequency of movements, simple reaction, response to an unexpected signal.

In the methodology and theory of boxing, 4 fundamental qualities are conditionally distinguished: endurance and speed, strength and dexterity.

Rapidity is characterized as a complex of functional properties of the body, naturally and predominantly determining the speed characteristics of movements and the time of the motor reaction.

Assessing the manifestation of speed:

- ☐ Latent time of motor reaction;
- ☐ Single movement speed;
- ☐ Movement frequency.

The speed (speed) of the motor reaction is usually estimated by the latent time /0.14 - 0.26 sec/. Distinguish between complex and simple reactions. A simple reaction is a response by a known movement to a known but unexpected signal. For example, a well-known defense in response to a well-known opponent's blow. The visual-motor reaction time in young athletes varies within 0.10 - 0.25 sec. In the formation of the speed of a simple reaction, the most famous method is based on the repetition or faster response to an unexpected signal or to a change in the environment.

Depending on what the boxer focused on, 3 types of simple reactions can be distinguished. Let's take a closer look at each type.

touch type. The boxer in this case focuses on the appearance of the signal. For example, an attack with a blow. The athlete is waiting for the signal while mobilizing all his attention (at the same time, the motor centers of the cerebral cortex are in an inhibited state). In this case, the athlete is too constrained, his movements are sluggish and delayed in response to the signal. Often this happens in episodes when a boxer is waiting for a strong blow from his opponent and fearing this. In boxers, on average, the latent period of the sensory type of reactions is approximately equal to 0.20 seconds.

Motor type of reaction. In this case, the boxer will focus his attention on the preparatory stage of the start of the movement. In this case, the motor centers of the cerebral cortex are excited and are in the starting state. Excitation reaches the motor area of the cerebral cortex and meets there already prepared nervous formulas of response movement, and the corresponding motor impulses instantly rush to the organs of movement. As a result of this, the executive signal of the enemy's action is reduced to an elementary "starting signal", to which a ready-made response is triggered.

The features of the formation of the speed of a complex reaction can be analyzed using the example of 2 types: reactions to a moving object (RDO) and choice reactions.

The reaction to a moving object is essential in boxing, this is due to the fact that the enemy (that is, the target) is constantly on the move, while changing the distance and its location, moves the body, makes strikes and defends, etc. The formation of this type of reaction occurs through exercises with a partner or when exercising on boxing equipment that is capable of making large oscillatory movements (pneumatic pears, stretch balls, pointballs , etc.) [15] .

The choice reaction is combined with the choice of the necessary motor response from a number of probable ones in accordance with the change in the partner's behavior. Example: the opponent will be able to attack with any punch, while the boxer has the choice of defending or counter-punching.

The reaction of prediction is based on the ability of a young athlete to probabilistically predict the opponent's actions. For example : It takes much less time to strike, not at medium or close range, than to execute a defense. Consequently, the attention of a young boxer should be focused on the perception of not the action itself, but the movements that prepare it.

As a means of forming the speed of movements, exercises are used, the implementation of which is possible at maximum speed. Funds must meet certain criteria:

- ☐ The technique of the exercise should be such that they can be performed at maximum speeds;
- ☐ Methods and means must be mastered by the athlete very well. This is necessary so that during the movement, volitional efforts are aimed at speed of execution;
- ☐ The duration should be such that by the end the speed of execution does not decrease due to fatigue. Speed exercises are considered to be the work of the greatest power, the duration of which does not exceed - 15 seconds.

To develop the frequency of movement (the number of movements per unit of time), it is advised to set the pace of the exercise using the voice (for example, pronouncing - " ta-ta -ta", "one-two-three"). The speed of the exercise depends on the speed of pronunciation .

Speed in boxing is found when performing single strikes when attacking and counterattacking, or when performing a defense, a series of strikes, connecting strikes and defenses, preparatory and false actions, movements and movements, switching from one action to the next.

Strength Development Methodology

Strength is the ability to overcome external resistance or counteract it through muscular effort.

There are several types of power abilities:

☐ Power in two modes (slow and static). With regard to boxing, this can be the capture of an opponent in close combat, release from a hold, arms under strong blows from an opponent, tension in the abdominal muscles during blows to the body, pressure from an opponent, etc.

☐ Power-speed abilities. The method of re-progressive exercise in the formation of the ability to manifest significant strength in conditions of rapid movements is very well known. In this case, the greatest power effort is formed by transferring any unlimited burden with the greatest speed. An essential variety is "explosive strength", which is characterized by the ability to show large amounts of force in a short period of time (a blow in boxing). Consequently, strength qualities in boxers are closely associated with speed and endurance. Power qualities are dependent on the activity of the central nervous system (central nervous system), the cross section of muscle fibers, their elasticity and biochemical processes that occur in the muscles. A large role in the manifestation of muscle strength is given to volitional efforts.

The means of developing strength are considered exercises with increased resistance or strength exercises. Depending on the nature of the resistance, strength exercises are divided into groups:

☐ External resistance exercises. When performing them, apply:
☐ weight of objects;
☐ counteraction of the enemy;
☐ resistance of elastic objects;
☐ resistance of the external environment;
☐ Exercises that are weighed down by the weight of your own body.
☐ Exercises with weights. They are very convenient due to their versatility, it is possible to act on the smallest and largest muscle groups. Exercise is very easy to dose.

In addition to the above division, it is possible to classify according to the level of selectivity of exposure or according to the mode of muscle functioning. For example : dynamic and static, power and speed-power, yielding and overcoming. One of the main problems in the formation of strength abilities is related to the choice of resistance level, the optimal pace of exercise and speed.

The highest power voltage can be generated in a variety of ways:

☐ Overcoming unlimited weights with the maximum number of repetitions;
☐ Limiting growth of external resistance;
☐ Overcoming resistance with the greatest speed;

In the first direction, unlimited weights are used with the maximum number of repetitions, that is, the work is carried out "to complete failure." Sometimes boxing coaches joke about this: "an athlete performs such exercises as much as he can and 3 more times after that."

The level of resistance (weights) is distributed according to the following criteria:

☐ as a percentage of the maximum weight;

☐ by the difference from the largest weight (example - 15 kg less than the maximum weight);

☐ by the number of possible repetitions in one approach. For example , the weight that can be lifted from strength 10 times, etc.) (Table 1).

Table 1

o.	Weight designation (resistance)	The number of possible repetitions in one approach (PM)
.	Ultimate	1
.	near limit	2-3
.	Big	4-7
.	moderately large	8-12
.	Average	13-18
.	Small	19-25
.	Very small	Over 25

In terms of energy, "working to failure" is not beneficial, in addition, it happens to carry out more significant mechanical work than with increased weights in order to acquire a similar training effect. Such work has its advantages:

☐ A significant level of energy expenditure may be useful when the classes are conducted with a recreational purpose;

☐ The ability to exercise control over the technique allows exercises with unlimited loads;

☐ Such work also avoids injuries;

It is also important that at first the effectiveness of the force formation process practically does not depend on the level of resistance, as soon as this level exceeds the established minimum (40% of the maximum value).

The advantage of the greatest burdens is more and more pronounced with an increase in the duration of classes. In the process of training highly qualified boxers, non-limiting weights are used as additional methods. Example: the resistance level is set in the range from moderately large to large. During the process of force formation, the level of resistance changes properly. In the case when the student is doing push-ups in a lying position with support on a gymnastic bench and his strength grows so much that he performs the exercise 11 times, then the exercise needs to be complicated so that it can be performed only 6 times (say, doing flexion - extension hands in emphasis lying on the floor, then also with the support of the legs on the gymnastic bench, etc.).

The next direction involves the use of maximum and near-limit weights. The maximum training weight is the maximum weight that an athlete can lift without

significant emotional arousal (usually in this case, the weight is 15% less than the maximum value) [32].

Endurance is the ability to fight fatigue and maintain high performance throughout the entire boxing match. One of the measures of endurance is the time during which the athlete is able to maintain a given intensity of activity. Using this measure, endurance can be determined in an indirect and direct way. With the direct method, the athlete is offered to fight at a high pace during 5 rounds. To maintain a significant density of the duel, partners box one round at a time (each round is a "fresh" partner). Unfortunately, this method is inconvenient in most cases. Indirect methods are used to determine the level of endurance in competitive conditions. To do this, you need to calculate the coefficient of endurance:

Stamina Ratio = 3rd Round CABD/Full FABD
CEBD = CEA + CEZ
(Attack Effectiveness Ratio) CEA = Number of hits reached the goal / Total number of hits
(Defense Efficiency Ratio) KEF = Number of parries/Total number of strikes

During the formation of endurance, it is necessary to solve several problems for the comprehensive development of the functional properties of the body, which determine the overall endurance and its special types. The solution of the tasks set is impossible without voluminous, rather monotonous and hard work, during which you will certainly have to continue the exercise, not paying attention to the onset of fatigue. This is related to the special criteria for the volitional qualities of athletes. The formation of such a quality as endurance can be realized as a whole with the process of forming industriousness and readiness to endure significant loads and very heavy feelings of fatigue. A significant emotional load is experienced in a fight by a boxer. Especially in long tournaments, athletes have to solve various tactical problems, while all the time, fixing the movements of the opponent. At least 2/3 of all muscles are actively working during the fight, which in turn requires a large expenditure of energy and places significant demands on the respiratory and circulatory organs. The state and possibility of forming such a quality as endurance can be judged by several criteria, such as:

- ☐ minute volume of breathing;
- ☐ maximum pulmonary ventilation;
- ☐ vital capacity of the lungs;
- ☐ minute volume of the heart;
- ☐ stroke volume of the heart;
- ☐ Heart rate;
- ☐ blood flow velocity;
- ☐ The level of hemoglobin in the blood.

A boxer's endurance base is considered to be a good general physical preparation, excellent breathing and the ability to relax muscles between an active strike ("explosive" actions) and the improvement of techniques. The higher the techniques are automated, the fewer muscle groups are involved in the performance of movements [18].

Several factors influence the fatigue process of a boxer:

. Intensity of action;
. The frequency of repetition of actions;
. Duration of actions;
. The nature of the pauses between actions;
. Style and manner of combat by the enemy;

Dexterity is characterized as a complex complex quality that does not have one criterion for its evaluation. The measure of dexterity can be the coordination complexity of motor actions and the accuracy of movements. Agility in boxing is expressed in the speed of transformation of movements in accordance with the demands of the changed conditions of the fight.

With the strengthening of sports specialization, the main line of the methodology for the formation of coordination abilities is the introduction of a factor of unusualness in the performance of habitual actions in order to ensure the growing demands for coordination of movements.

Table 2

o.	The content of the methodological technique (according to L.P. Matveev , A.D. Novikov)	Examples
.	Introduction of unusual starting positions.	Fighting in different stances: high, low, left-right-sided. The call of battle is not in your stance.
.	"Mirror" exercise.	Fighting in different stances: high, low, left-right-sided. The call of battle is not in your stance.
.	Change in speed or pace of movement.	Performing combat operations at different speeds and at different paces.
.	Changing the spatial boundaries in which the exercise is performed.	Training in the gym and outdoors. Conducting sparring on a reduced (divided by ropes) ring. Sports games on a reduced area
.	Changing the way you exercise.	Performing strikes, sewn, movements in various ways.
.	Complication of exercises with additional movements	Performing a series of strikes: in a jump, after a jump with a turn of 360□; after several somersaults over the head; after a series of turns etc.. .
.	Changing the resistance of those involved in pair or group exercises.	Fighting with partners of different styles (weight, height, etc.) Fighting with two partners; "wall to wall." Use of different tactical combinations.
.	Performing familiar movements in previously unknown combinations.	Performing combat actions in various combinations, previously unknown

.	Complicating the coordination of movements with the help of tasks such as juggling.	Juggling with a tennis ball: c - dribbling a tennis ball on the floor; - - throws and catches against the wall: - catching a tennis ball released by the other hand
o	Variation of tactical conditions.	Fighting with various sparring partners.
leven	The introduction of additional objects of action and special stimuli that require an urgent change in actions.	Fight using partners "wall to wall"; game exercises with an increased number of balls; training in front of spectators
2	Directed variation of external weights.	Work with hammers, dumbbells, gloves of various weights, with weights, shock absorbers
3	The use of various material-technical and natural-environmental conditions of classes to expand the range of variability of motor skills.	Performing exercises on various equipment (pneumatic and bulk pears, bags, alternating places of employment) in the fresh air and in the hall, at various sports facilities)

Exercises that are aimed at developing agility very quickly lead to fatigue. However, the exercise requires significant clarity of muscle sensations and has little effect in the onset of fatigue. Because of this, in the process of developing dexterity, rest breaks are used, which are enough for a relatively complete recovery of the body. Exercises should be performed when there are no significant signs of fatigue from the previous load.

The manifestation of such a quality as dexterity depends on the ability of the athlete to relax the muscles. Tension and stiffness in movements negatively affect the results. Muscle tension can appear in several forms. The first form is increased muscle tension at rest (tonic tension). The second form is the insufficient speed of relaxation (speed tension). The third - in the relaxation phase, the muscles remain in a state of excitation as a result of imperfect motor coordination (coordination tension).

To combat tonic tension use:

☐ relaxation exercises in the form of free movements of the trunk and limbs (like shaking or free swings, etc.);

☐ stretching exercises;

☐ swimming and massage.

To increase the speed of muscle relaxation, exercises are used such as: throwing, throwing and catching stuffed balls, jerk and the push of the bar, strong blows on the shells.

Coordination tension is gradually overcome in several ways:

. Explanation of the need to carry out the movement more intensely , easily and freely.

. Use of specific relaxation exercises. I.V. Levitskaya divides the exercises into the following:

A) during execution, in which the muscle passes from a tense to a relaxed state.

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B) in which the tension of some muscles is associated with the relaxation of other muscles.

C) in which it is necessary to maintain the movement by inertia of a relaxed part of the body due to the movement of other parts.

D) during the execution of which, the athlete is offered to set the rest time himself and during this time to relax the muscles to the maximum.

When performing exercises for tension - relaxation of the muscles, it is necessary to combine them with holding the breath and inhalation, relaxation is combined with active inhalation. In order for the movement to be carried out to be not tense and free, it is necessary to sing or smile during its execution, you can close your eyes for a few seconds and look at facial expressions, tension, by the way, is very clearly detected in facial expressions. It is necessary to strain the muscles of the whole body when performing movements, hold your breath, and then sharply relax and immediately start moving. It is considered useful to perform exercises in a state of fatigue, this is due to the fact that fatigue forces one to concentrate efforts only at the right moments.

The boxer's ability to maintain balance determines the process of agility manifestation [17].

2.2 Exercises for a boxer

For general physical training, it is worth selecting exercises from other sports that are more in line with the nature of the boxer's actions and contribute to the formation of physical qualities. Certain types of physical exercises have a positive effect on a young boxer. But however, there is a negative impact on the process of forming the necessary skills and qualities. For example : according to the speed of movements, fencing can be attributed to complex motor reactions, but at the same time, a straight back, turned feet and legs strongly bent at the knees, limited directions of movement, most likely, harm the formation of coordination and dexterity of a boxer . Exercises in the bench press with large weights contribute to the development of the strength of the upper limbs, but limit the speed of striking, etc. [16].

Therefore, it is very important to make a competent selection of types of exercises that contribute to the improvement of body functions in the direction necessary for a boxer and at the same time positively influence the development of the necessary skills and abilities and in no way hinder their development. Usually, any exercise has a main focus (for example, it forms speed) and at the same time contributes to the development of other qualities.

The effect of fast walking. A huge number of muscle groups are included in the work with rhythmic and prolonged walking, while the activity of the cardiovascular and respiratory systems of the body increases, metabolism increases, internal organs are strengthened, and their functions are improved. Walking has a positive effect on the formation of endurance and strong-willed qualities.

The most common form of exercise is running. It is also an integral part of many sports. In the process of running, unlike walking, huge demands are placed on the performance of the body. This is due to the fact that the intensity of the work of muscle groups is much greater, as a result, the activity of the cardiovascular and respiratory systems increases, and metabolism increases markedly. By changing the length of the distance and the speed of running, it is possible to dose the loads, thereby influencing

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the formation of endurance, speed and other qualities that a boxer needs. A long unhurried run, especially in a forest or park, is of great psychological and hygienic importance. Fast running has a positive effect on the formation of endurance and speed. During the run, volitional qualities and the ability to calculate one's strength are formed. When training a boxer, running occupies a special place.

The alternation of walking and running at distances from 3 to 10 km is called mixed movement. The mileage depends on the level of training of the athlete and on his age. In contrast to running, mixed movement is characterized by lower intensity and high volume load. On the days allotted for general physical training, most boxers choose this type of training. The pace of running can be medium or variable with spurts of 60, 100 and 200 m, after which again easy running, smoothly turning into walking. While walking, if necessary, you can perform various exercises (arm swings, head rotations, etc.).

Running with obstacles. A boxer in a 500m or 1 km run overcomes obstacles and thereby increases his dexterity, strength and speed, balance and ability to short-term tension of most muscle groups, and forms overall endurance. Barriers (to jump over), fences (to climb over), logs (to run through), etc. can be used as barriers. In the case when running is carried out in a forest or park, you can use stumps and bumps, logs and ditches as an obstacle, jump over puddles and branches, etc. Relay races between teams can become interesting and exciting.

Skating and skiing have a positive effect on all muscle groups and organ systems . These sports have a beneficial effect on the formation of general endurance (strength and speed). Of particular importance is cross-country skiing, with this sport all muscle groups are included in active work, it is only necessary to alternate relaxation and tension. Cross-country skiing has an excellent effect on the psychological state and is considered one of the means of active recreation. Skiing has a positive effect on the mental state of the athlete, is an excellent means of active recreation.

An indispensable part of the physical training of an athlete is outdoor and sports games. Games such as handball and basketball, tennis and hockey, relay races for speed and agility are very similar to boxing in terms of the nature of actions, speed and endurance. Games are characterized by fast movements, stops and turns, etc. The listed games can contribute to the development of dexterity and speed, endurance, etc. If the games are played in the fresh air, it will have a very beneficial effect on strengthening the nervous system, metabolism improves, and the activity of all organs of the body increases. Mobile games are active recreation.

A sharp increase in the level of oxygen consumed by the tissues depends on the intensity of the game. The level of oxygen consumption increases by about 8 times compared to the resting state. Enormous changes are made in the motor apparatus: the muscles are strengthened, their strength increases, elasticity increases, the joints become more mobile.

Struggle. Wrestling is characterized by short-term maximum tension, breath holding, and sometimes prolonged efforts. Wrestling helps to increase the speed of movements, increase the strength of the muscles of the girdle of the upper limb. In addition, the joints are strengthened, movements become more elastic. During wrestling training, positive psychological qualities characteristic of a combatant are formed.

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Fighting in a stance resembles actions in close combat (for example, the struggle for stability, for an advantageous position of the arms and head, dives and slopes back, to the sides when an opponent tries to grab his neck, etc.). This type of exercise is used during a special training session at the very beginning of the session (warm-up period) or vice versa at the end, the choice of time depends on the focus of the session.

Rowing as a type of exercise is used in the transition period or at the beginning of preparatory for outdoor activities. Rowing contributes to the development of strength and flexibility of the muscles of the upper and lower extremities, torso. If we compare the nature of the movements, then rowing is not like boxing movements, because of this you should not get carried away with it.

Acrobatics, gymnastics without shells and on shells. Exercises on gymnastic equipment, jumps and floor acrobatic exercises are mainly aimed at improving the motor skills of athletes, at developing strength and balance. Mandatory for boxers are exercises for coordination, flexibility and strength, speed and courage. Gymnastic exercises can be used at the warm-up stage or in the second half of special exercises aimed at developing the strength and flexibility of certain muscle groups.

Block installations or an expander are characteristic projectiles for developing muscle strength. Widespread in almost all sports have found exercises with the help of blocks, rubber or. Such exercises develop strength qualities and increase muscle mass. However, they should not be carried away, as they enslave the muscles and the movements become constrained. Because of this, after a set of such exercises, it is necessary to perform speed exercises with large amplitudes without stress.

Fencing contributes to the formation of such qualities as speed, develops a sense of time and distance, accuracy and high coordination. Fencing can find its place in the general system of a boxer's physical training, especially in the transition period.

Cycling promotes the development of muscles and joints of the lower extremities, has a positive effect on the cardiovascular and respiratory systems, increases gas exchange and metabolism. The formation of endurance occurs while riding a bicycle over rough terrain.

It is very important for a boxer to swim in different styles. Swimming movements, rhythmic breathing contribute to the formation of the ability to consistently relax and strain, develop the chest, and develop freedom of movement. In addition, swimming has a significant hygienic and health-improving effect, calms the nervous system. After a special training or practice free swimming as a means of restoring the body after significant stress in all periods.

Jumping into the water from a low height, with a parachute, ski jumping contribute to the development of courage and determination, coordination. Such exercises are advised to use in the transition period, it is also a means of active recreation.

Exercises with a barbell or dumbbells are significant in the physical preparation of boxers. After analyzing many scientific studies, we can conclude that various exercises with low weights for certain muscle groups are an effective means of building strength endurance and developing speed. Such exercises should be combined with exercises for the development of speed without weights (for example, bends, squats, etc.). In terms of number of exercises with weights, they make up one third of exercises without weights.

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Weighted exercises are used in all periods of boxers' training, depending on the goals of the period and each lesson separately. Special preparatory exercises contribute to the formation of speed and strength endurance in boxers, usually these are exercises with small dumbbells (from 0.5 to 2 kg). With dumbbells, they conduct a shadow fight, work out actions related to defenses and a number of exercises - in swings, flexion and extension of the upper limbs. After three minutes of active exercises with dumbbells, you should perform similar exercises for five minutes, but without dumbbells. This alternation can be repeated 2-3 times. Typically, such exercises are used during morning exercises and at specially allotted time for general physical training in the transitional and even preparatory periods.

Exercises with clubs and a gymnastic stick belong to the group of exercises with weights. They can have a purely swing or shock character. A weighted stick is used to hit an object that absorbs the blow (a blow to a car tire). Blows are applied from the side, from above and below, holding a stick in one or both hands. The exercise contributes to the development of strength and speed of contraction of the muscles involved in striking, thus, speed-strength qualities are formed.

Throwing a medicine ball is also an integral part of a boxer's training. The ball is thrown from different positions (standing and sitting or lying down) with one or two hands. The most effective ball throwing exercises are in moving backwards, forwards, to the sides and in a circle. Such exercises develop speed-strength qualities and form speed endurance and orientation, the ability for short, large power tensions and muscle relaxation.

Accuracy, speed and coordination form exercises with a tennis ball. Exercises can be performed alone or with a partner (for example, tossing a ball). Exercises are used in all types of classes, most often at the end of a lesson as a distraction.

Exercises with a partner in resistance (from the fulcrum), in pushes (" push-push ") from a standing, sitting and lying position also contribute to the formation of strength endurance and balance.

Exercises from the athletics cycle, for example, shot put, grenade throwing, long and high jumps with a run, contribute to the development of speed and strength of individual muscles, speed develops, etc. speed. Such exercises are very famous among boxers and are included in the system of general physical training.

After the last tournament, the boxer rests from special exercises. If this falls on a transitional period, then the best outdoor activity is a tourist trip or stay in the middle mountains, walking and climbing accessible mountains.

Physical training exercises are considered necessary in the general training system of boxers and occupy at least half of its volume. When selecting exercises, it is taken into account that the highest indicators in one of the physical qualities can be achieved only with a sufficient level of development of the others.

Exercises for boxers with special equipment [20]

An obligatory part of the training process are exercises with special boxing equipment that develop the necessary physical qualities and improve technical skills.

Jump rope exercises. Long jumps and jumps through the rope help to strengthen the muscles of the legs, develop coordination and ease of movement. Each workout, especially if it is of a specialized nature, should last from 5 to 15 minutes.

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Exercises with a bag contribute to the development of the skill to properly hold a fist during a strike, to rationally use muscle efforts in strikes at different distances, to calculate the force of a blow, especially if several blows are delivered quickly. The bag is an excellent projectile used for the development of speed and strength endurance. The development of special endurance is facilitated by the desire to inflict as many strong blows as possible in a certain period of time. For classes, bags of various shapes can be used. The bag of oblong shape and small diameter is very convenient for striking straight and from the side, short bags are used for striking directly and from below. Almost all halls have a universal bag. The bags are movable and due to this, the boxer can improve his skills in delivering punches with progressive movement back and forth, a sense of distance develops. The exercise often begins with single strokes, then two successive ones in different combinations, and at the end, a series with separate accented strokes. On a bag moving in a circle, punches are improved when the boxer moves forward and in a circle. Blows on the bag are applied straight, lateral and from below, long and short (both in the lateral position of the boxer, and in the frontal position).

Exercises with a pear (bulk or filled with water). Exercises with pears (bulk) are very similar to exercises with bags. Pears with sand and sawdust - hard and heavy; filled with peas - much softer and lighter, mobile, with a greater range of motion, they can be used for stronger single, double blows or series of blows that develop a sense of distance. A pear filled with water is a good shock absorber, very heavy and mobile.

Different masses, rigidity of the shells gives the boxer the opportunity to vary his actions, select the required distance and develop the accuracy of the blow. On one pear, you can deliver a more accentuated blow in a series, on the other (with sand) - to speed up the delivery of blows, but not strong ones, etc. Often, all types of pears are hung close to each other, and the boxer practices strikes during the round, smoothly moving from one pear to another, achieving perfection in the speed of blows, accuracy in calculating the distance. From all combat positions it is possible to strike.

Wall pillow exercises. They are usually used in classes with a group of beginner boxers. On this projectile, mainly direct blows are applied. The flat surface and immobility of the projectile make it much easier to calculate the length of the impact. The wall cushion can be hit both from the spot and with a step forward.

Exercises with a pneumatic pear. Pears are divided into standard and somewhat reduced. Reduced ones fly off much faster on impact. A clear rhythm of strikes on the platform forces the athlete to maintain the pace of the exercise and strike with a set frequency and force. The stronger the blow, the faster the pear moves. Exercises with a pneumatic bag contribute to the development of a boxer's ability to strike accurately and quickly, develop a sense of attention and rhythm of movements. Prolonged rhythmic blows on the pear are an excellent tool for building speed endurance of the upper limb belt and the ability to relax the muscles at the moment of swing for the next blow.

Training on blows on a pneumatic bag begins with moving the body weight from foot to foot and moving the arm forward to strike and take it back. The correctness of hitting the pear with a fist depends on this. Initially, you need to learn direct single punches in the rhythm of "one-two-three" (the pear is repelled three times from the platform). It is necessary to strike the pear after it, having pushed off from the back of

the platform, has not yet reached the middle. Having mastered this technique, they switch to strikes after each repulsion of the pear from the front and back of the platform. In the same order, they study the technique of exercises and blows from the side. Hitting should be done with both the left and right hand, sometimes you can hit several times with one hand, then alternately with one and the other, etc. Having studied the exercises in different rhythms, a boxer can practice punches, arbitrarily alternating them in a different order and changing pace of movement. Impacts on the pneumatic bag are applied from the frontal position.

Rubber ball exercises. Rubbers are attached to the ball, one of which is attached to the bracket with its free end upwards, the other - at the same distance - to the floor, the ball can vibrate horizontally. Hitting the ball forces it to move back and forth. Direct blows are applied from the side combat position with one hand or alternately (either left or right). The rhythmic movements of the ball force the boxer to keep up the pace, strike with a set frequency and force. The ball must be hit as if following the ball when it is moving away and is in the middle of the amplitude or a little further. A sense of distance, accuracy and speed of striking, coordination and orientation are formed. The ball can be used to develop the speed of performing slopes back and to the sides (for example, by hitting the ball, give it a sufficient range of motion, make a slope with the body, and then hit the ball again). You can also apply single blows from the side to the right and left.

The same ball on rubber is strengthened in a horizontal position. On it, strikes from below with left and right are improved, short direct strikes can also be carried out.

Exercises with a small hanging ball (pointball). A tennis ball is suspended from a horizontal platform (or on a bracket near the wall) at head level and single hits are applied to it - straight, from the side and from below. You need to hit the heads of the metacarpal bones of the index and middle fingers. Exercises on this projectile contribute to the formation of hit accuracy.

Exercises with boxing paws. With their help, they improve strikes that develop speed of reaction, orientation and accuracy. Paws are used at all stages of the training of the boxer. The trainer holding the paws substitutes them for strikes at different distances: at the far side - for straight lines, at the middle and near side - for strikes from the side and from below. At the same time, it is important to monitor the accuracy of strikes, the transfer of body weight from foot to foot, the movement of the center of gravity and the accuracy of the blow. Pre-installed paws make it possible to improve the application of several direct blows in a certain combination with lateral ones (lateral ones - blows from below, etc.). Combinations of blows are improved to automatism with an emphasis on some individual blow. The coach may ask the athletes to perform several combinations in the prescribed sequence.

Holding the paws and moving around the ring, the coach changes the distance, and this in turn forces the athlete to either advance or step back, to the sides and in a circle, thus calculating the distance for striking.

To develop a reaction, the trainer suddenly changes the position of the paws, for example, exposes the paw for a direct or side kick or bottom kick (left or right hand), for two and three kicks, etc.

The trainer can put on large combat gloves and put them in place of paws. In this case, the boxer is offered to solve technical and tactical problems, to show open places with light blows during attacks and counterattacks. For example, the trainer gets into a fighting position and delivers a direct left punch to the head, the boxer should slant to the right and counter with the left punch to the body, i.e. into the glove substituted by the trainer in the region of the celiac (solar) plexus; when the coach inflicts a left side blow to the head, the boxer dives and responds with a right side blow to the head, i.e. into the trainer's right glove, etc.

In exercises with paws, you can organize the situation, which is typical for many combat episodes.

However, training on the feet can have a negative effect if the trainer does not know how to use them skillfully enough. For example, he puts his paws away from the affected places or towards the blow, thereby violating the distance that the boxer expects, and this disorientates the student. Do not get carried away with exercises on the paws and replace them with combat exercises with a partner in gloves.

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