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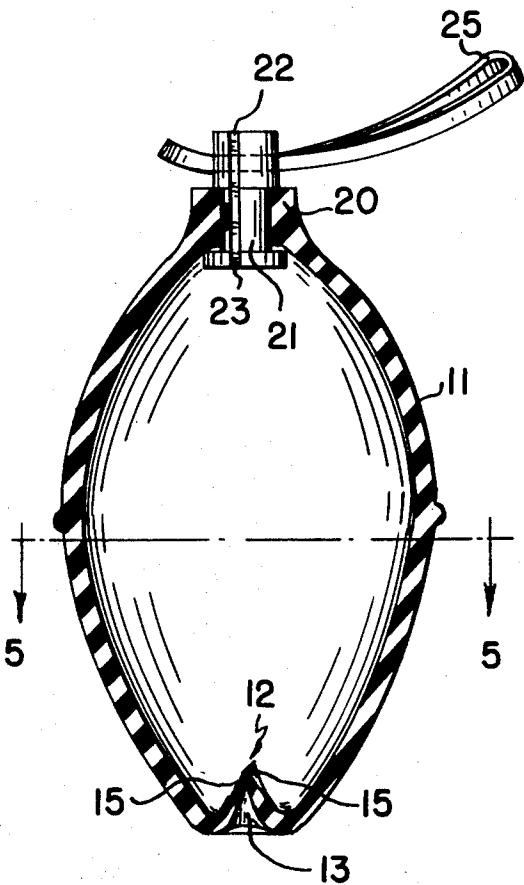
[54] **SQUEEZE BULB EXERCISING DEVICE FOR THE HANDS AND THE LIKE**  
**1 Claim, 5 Drawing Figs.**  
[52] **U.S. Cl.**..... **272/68**  
[51] **Int. Cl.**..... **A63b 21/30**  
[50] **Field of Search**..... **272/67, 68,**  
**79, 82; 230/169; 222/215, 209; 128/232, 231, 240,**  
**241**

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**ABSTRACT:** A hand exerciser device comprises a hollow deformable bulb of resilient material and of a size and shape adapted to be alternately gripped and released by the hand of a person by which the bulb is compressed from a normally expanded condition to a collapsed condition, the bulb having air flow control means between the interior and exterior thereof which permits relatively rapid intake of air when the bulb expands and offers resistance to the expulsion of air from the bulb so as to provide a yielding resistance to the collapse of the bulb proportional to the squeezing forces applied thereto. A loop is attached to an air flow control member to receive the finger of the hand squeezing the exerciser device to position the device in the hand.

The present invention relates to a device for exercising the hands of persons by providing a form which can be gripped and squeezed to a compressed condition and then released for return to its normal form so as to exercise the muscles and joints of the hand.



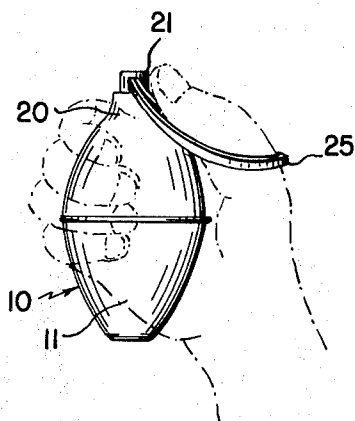


FIG. 1

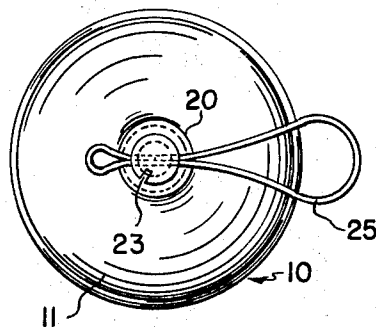


FIG. 3

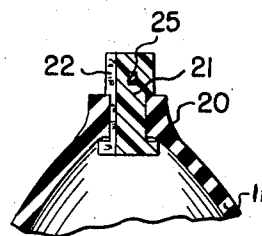


FIG. 4

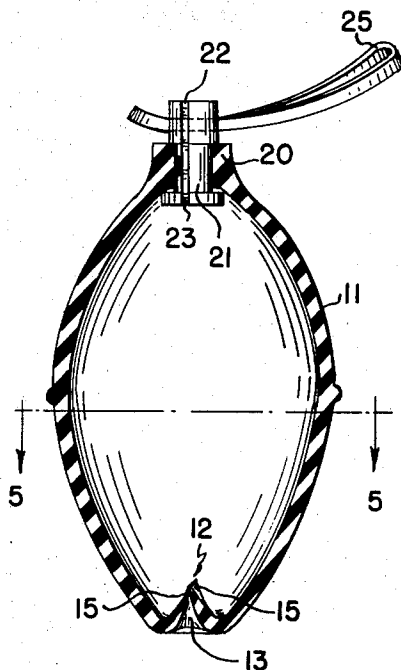


FIG. 2

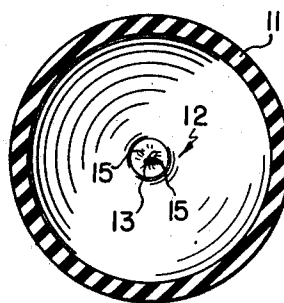


FIG. 5

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## SQUEEZE BULB EXERCISING DEVICE FOR THE HANDS AND THE LIKE

It has been found desirable to provide devices which can be alternately gripped and released by the hand of a person and which offer resistance to the gripping or squeezing action to thereby provide exercises for strengthening and limbering the muscles and joints of the hand. Such devices generally comprise a spring-like member or mechanism which resists squeezing action; however, these devices have the disadvantage that the resistance to the gripping or squeezing increases as the extent of gripping movement of the hand increases. Accordingly, one device may offer too much resistance to gripping to be effective thereby necessitating costly and troublesome adjustments or a selection of a variety of devices of different resistances. Furthermore, some known devices build-up forces which may be suddenly released and the reaction may result in injury to the user.

The principal object of the present invention is the provision of a new and improved gripping and relaxing type hand exerciser device which offers resistance to gripping which is proportional to the squeezing forces applied to the device and which yields to permit a full squeezing movement or stroke of the hand being exercised irrespective of the lightness of the grip above a nominal minimum. Thus, the device may be used to effectively exercise hands of widely varying degrees of strength and flexibility without adjustments or danger of snap reacting movements of the device.

In carrying out the invention, we provide a hollow bulb formed of resilient flexible material, such as rubber or the like, and of a size and form, when in a normal condition, to be readily gripped by the hand of a person, the bulb having air flow control means which is effective to resist the flow of air from the interior of the bulb as the walls of the bulb are collapsed by gripping action whereby a yielding resistance to the squeezing of the bulb is provided, and which air flow means permit free inflow of air into the bulb to cause the bulb to rapidly resume its normal expanded condition when the gripping or squeezing forces thereon are substantially relaxed or removed.

Another object of the invention is the provision of an exerciser device of the character mentioned which can be easily and comfortably grasped in the hand and which has a loop for securing the device in operative position relative to a relatively feeble hand.

Other objects and advantages of the invention will be apparent from the following description of a preferred form thereof, reference being made to the accompanying drawings wherein:

FIG. 1, is a perspective view of a hand exerciser device embodying the invention;

FIG. 2, is a longitudinal section view of the hand exerciser device;

FIG. 3, is a plan view in elevation of one end of the exerciser device;

FIG. 4, is a fragmentary sectional view showing details of an air flow control member of the device, and

FIG. 5, is a sectional view taken substantially along line 5-5 of FIG. 2.

Referring to the drawings a hand exercising device 10 is shown which embodies the invention and it comprises a hollow elliptical shaped bulb 11 formed of resilient and flexible walls. The bulb 11 is of a size which can be comfortably grasped in the hand of a person and can be alternately squeezed to a compressed form and released to provide a hand strengthening and training exercise. Preferably the bulb 11 is molded of a suitable rubber or rubber like material which normally assumes an expanded condition when it is released from a hand grip. The walls of the bulb 11 may be relatively easily collapsed by a gentle squeezing action when the air in the interior is permitted to be expelled.

The flow of air into and out of the bulb 11 is controlled by means which permits free inrush of air as the bulb expands and restricts the flow of air from the bulb to yieldingly resist collapsing or compression of the bulb walls. The air flow control

means comprises a check valve structure 12 at one end of the bulb. The check valve 12 is formed by an inwardly extending, tapered tubular inlet 13 formed integral with the bulb walls, and the inner end of which inlet has opposite side walls 15 which normally engage one another to prevent flow of air outwardly from the bulb 11. The pressure of air inside the bulb 11 tends to force the walls 15 against one another and thereby seal the inlet passage at its inner end against outward flow of the air. When the bulb 11 expands from a collapsed condition by its release from a squeezing grip, air easily enters the inlet 13 and separates the walls 15 to enter the interior of the bulb. Any other suitable check valve structure could be employed.

The end of the bulb 11 opposite the end having the check valve 12 has a neck 20 formed integral therewith, and a cylindrical air bleed control plug 21 is sealingly retained inside the neck. The plug 21 may be formed of a suitable material which is somewhat harder than the material forming the bulb 11 and it has an air bleed slot 22 formed in one side. The slot 22 extends from one end of the plug 21 to the other, and the walls of the slot cooperate with the interior surface of the neck 20 to form a restricted air passageway 23 through the neck. The cross-sectional area and the relatively lengthy character of the slot 22 cause an appreciable restriction to the expulsion of air from the interior of the bulb 11, and as the pressure tending to collapse the walls of the bulb increases, the resistance to the flow of air through the passageway increases. Thus, the stronger the grip of the person squeezing the bulb 11, the greater is the resistance to the grip. In any case, however, the resistance to the gripping or squeezing forces on the bulb 11 fades or yields as the air is expelled from the collapsing bulb through the passageway 23, and the bulb can be substantially completely collapsed merely by the application of a nominal force as required to flex the bulb walls. Thus regardless of the lack of strength of the hand gripping the bulb, a wide amplitude of gripping movement is achieved because the air is expelled permitting complete collapse of the bulb. This provides a full squeezing action of the hand so as to provide maximum effect of the exercise. It is apparent therefore that the exerciser 10 provides a degree of resistance to squeezing action which is proportional to the vigor with which the device is gripped and the extent of the constriction of the device does not appreciably affect the resistance offered to the squeezing action. Accordingly, a single exerciser device 10 may be used to provide effective exercises for hands having a wide range of strength and manipulative abilities. The absence of springs and like elements eliminates the hazards of a sudden release of built-up forces likely to result in propelling the device in an injurious manner.

A loop 25 of elastic material, such as a rubber band, is secured to the outer end of the plug 21 by insertion of one end of the loop through a cross bore through the plug. In the event the hand using the exerciser 10 is feeble or the finger joints are stiff and difficulty is experienced in retaining the bulb in the palm of the hand, a thumb or finger may be inserted through the loop 25 to retain the exerciser in proper position in the palm of the hand.

It will be seen that the exerciser is highly effective for exercising hands and other members of a person's body wherein the exercise consists in overcoming resistance to movement of the members. The device is effective over a wide range of users and is inexpensive to manufacture yet is desirable and troublefree in its operation.

Although but one form of the invention has been shown, it is to be understood that other forms and modifications and adaptations could be made, all falling within the scope of the claims which follow.

We claim:

1. An exerciser device comprising a hollow bulb formed of flexible resilient gas impervious walls which are normally urged to an expanded condition and which may be collapsed by the gripping of the bulb by a person's hand, valve means at one end of said bulb to block the flow of air therethrough when the walls of the bulb are collapsing and to freely admit

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air from the atmosphere into said bulb as the walls thereof move from a collapsed condition to said expanded condition, air flow control means at the opposite end of said bulb for providing a relatively restricted air passageway from the interior of said bulb to atmosphere and thereby provide an appreciable yielding resistance to collapsing of the walls of said bulb, said air flow control means consisting of said flexible walls at said opposite end being formed in the shape of a neck, a plug in said neck comprised of material which is hard relative to the walls of said neck, said plug having a slot extending longitudinally in one outer surface thereof and from one end

of said neck to the other to thereby provide a restricted air passage through said neck; one wall of said passage formed by a portion of said wall of said neck and the other walls of said passage formed by the sides of said slot, said plug having a portion extending beyond the outer end of said neck, and a flexible loop member attached to said extended portion of said plug and extending generally laterally from one side of said neck and adapted to receive a finger of a person's hand gripping said bulb so as to retain the bulb in the palm of the hand when the hand relaxes.

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