Sept. 18, 1956 H. J. SLAYTON 2,763,483

EXERCISE TOYS

Filed Feb. 12, 1954

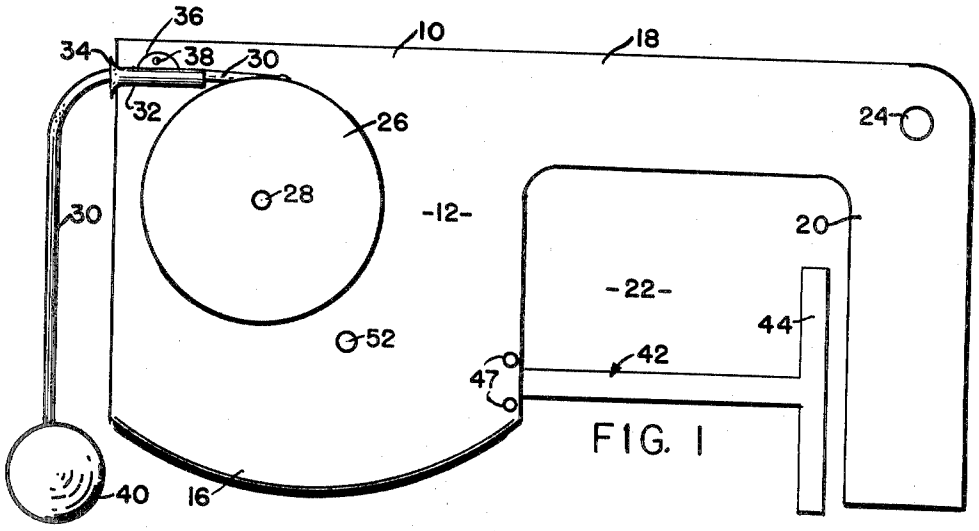


FIG. 1

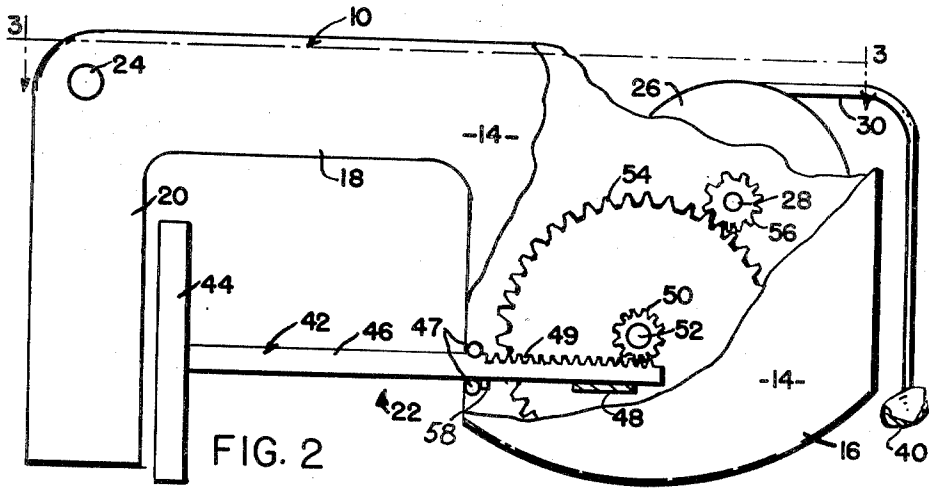


FIG. 2

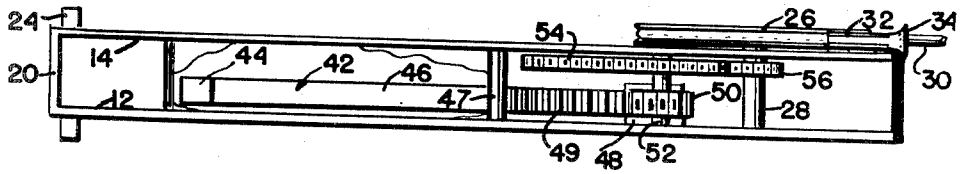


FIG. 3

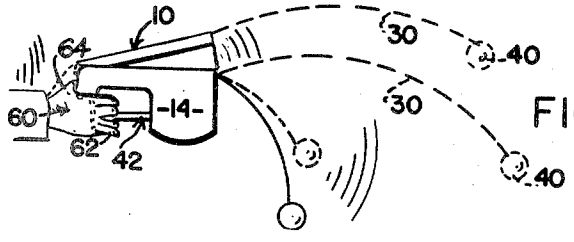


FIG. 4

INVENTOR.
HENIS J. SLAYTON
BY Patrick F. Henry
ATTORNEY

United States Patent Office 2,763,483 Patented Sept. 18, 1956

2,763,483

EXERCISE TOYS

Henis J. Slayton, Atlanta, Ga.

Application February 12, 1954, Serial No. 409,913

10 Claims. (Cl. 272—68)

This invention relates to an exercise toy and particularly to a hand operated device of this sort with means for selectively extending and retracting a flexible member as the hand and arm are moved.

There is always a need for an inexpensive device which will challenge the skill of or otherwise amuse a child so as to occupy his time and provide him with pleasant recreation. The value of such a device is further enhanced if it provides physical action and exercise as well as requiring some measure of skill since growing children seek an outlet for large amounts of energy. Furthermore, there is a need for such a device for use in rehabilitating adults after illness or accident has damaged certain of their muscles, nerves, and bones.

An object of the present invention is to provide an interesting and amusing exercise toy which is hand operated and which encourages strength and coordination.

An additional object is to provide an exercise toy which is simple in construction and inexpensive to manufacture.

Another object of the present invention is to provide a hand operated exercise toy which may be readily adjusted to require the application of more hand and arm strength thereby providing a progressive building of muscle and coordination.

A further principal object of the present hand operated exercise toy is an arrangement for keeping a weighted, flexible member moving in different directions with as much speed as possible through the skillful manipulation of the hand.

Generally described, the present invention comprises a base member which may be supported by one hand, a hand control and drive member movably mounted on said base member, a long, thin flexible member mounted for extension and retraction on said base member through the action of said hand drive member, and weight means on the end of said flexible member, whereby said flexible member may be moved at different speeds and in different directions in response to the hand operation of the control and drive member.

Other and further objects and advantages of my invention will be apparent from the ensuing description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side elevation view of a preferred embodiment of my invention with the flexible member almost retracted.

Fig. 2 is a side elevation view of the other side of the invention in Fig. 1 with part of each of the side walls broken away to expose the drive mechanism.

Fig. 3 is a top plan view of the device taken substantially along the line 3—3 of Fig. 2 and with a portion broken away to show the plunger.

Fig. 4 is a diagrammatic view illustrating in part the manner of operating the present invention.

Referring to the drawings, the device is adapted to be held in the hand somewhat like a pistol and comprises a substantially chambered base or hollow holder member **10** having opposed side walls **12, 14** joined to each other around their margins and being enlarged adjacent the

front **16** but narrowing near the upper rear **18** to form a handle grip **20** defining a hand slot **22**. Hand grip **20** is provided at the top thereof with opposed finger lugs **24** which serve as additional grips to those who so desire it.

A pulley **26** is mounted for rotation with shaft **28** carried by opposed sides **12, 14** and has wound thereon a flexible, cord-like member **30** which is fed outwardly from the front **16** of base **10** through a small tubular conduit **32** with a flared or bell-like end **34** passing the member **30** smoothly from the front thereof. Conduit **32** is held in place on side **12** by means of a small plate **36** and screw **38**. Flexible member **30** is weighted at the outer terminal end thereof to hang downwardly as by a rubber or plastic ball **40** which may be of any size and shape and of different weights depending upon the particular person for whom the device is constructed. Pulley **26** is arranged to act as a means for retracting and storing the flexible member **30** on the base **10** and is driven by the hand through a drive means comprising a hand plunger **42** with a finger grip **44** and shaft **46** mounted for sliding, reciprocating action in the base **10**. Plunger shaft **46** is held between spaced journals **47** on sides **12, 14** and slides in a support block **48**. A rack **49** is formed on the inner end of plunger shaft **46** and meshes with a pinion drive gear **50** carried by shaft **52** which is rotatably supported on opposed sides **12** and **14**. Also fixed on shaft **52** for movement therewith is a large drive gear **54** which meshes with another pinion gear **56** fixed on shaft **28**.

With the above described arrangement, in Fig. 2 as pinion **50** is driven with shaft **52** counter-clockwise through the action of rack **49** moving toward the front **16**, drive gear **54** turns pinion **56** clockwise thereby moving its shaft **28** and pulley **26** in the same direction which unwinds the flexible member **30** under assistance from the weight **40**. The heavier the weight **40** the more force exerted to unwind the pulley **26** or likewise if weight **40** is already moving then more force is being exerted on pulley **26**. Pulling the plunger **42** back toward handle **20** reverses the above described action and thereby re-winds the pulley. In a succession of pushes and pulls the plunger **42** will cause the flexible member **30** to gather momentum in one direction of unwinding and then in the other upon stopping said plunger movement and reversing it so that the member **30** remains substantially in constant motion through the winding and unwinding, centrifugal and centripital forces, and changes of direction of both the hand and the arm. The length of flexible member **30** extended depends upon the distance the rack is moved on the pinion **50** and this length may be readily varied on successive strokes simply by making shorter or longer pulls or pushes on the plunger **42**. Coordination of this action becomes more difficult as the weight **40** gathers momentum and as the speed of winding and unwinding increases.

Plunger shaft **46** is held in place for reciprocatory motion and rack **49** is held in firm engagement with pinion **50** through the confinement of shaft **46** in the journals **47** and the support block **48**. All the drive mechanisms except the pulley **26** are normally enclosed within the casing formed by side walls **12, 14** so that there is no chance for the flexible member **30** to become entangled in one of the gears. Likewise, smooth entrance to and exit from the pulley **26** by the member **30** is assured through the use of the conduit **32**. Member **30** may be of any preferred diameter and material, such as cord or wire, as long as it is reasonably flexible so that it is readily wound and unwound upon the pulley **26**, its function being to provide a fast means of retracting and positioning the flexible member **30** on base **10** and for extending the member **30** in response to the demand created by force on the plunger **42**. The relationship between the size of gear **54** and that of pinion **56** is such as to make available suitable speed at the pulley **26** from force exerted on plunger **42**.

Many patterns of movement of the flexible member **30** are possible with the present invention and are primarily a matter of the skill of the person operating the device. Fig. 4 illustrates a few of the basic movements produced upon slight movement of the plunger **42** with a very limited movement of a hand **60**. One satisfactory way of holding the device is with the fingers around the grip **44** in the manner of Fig. 4 where fingers **62** are shown in arrangement with two fingers above the shaft **46** and two below the shaft **46** and with the thumb **64** over one of the lugs **24**. This permits complete freedom in actuating the plunger **42** so that it may be pulled or pushed or released at will and during the fast motions. If the hand is rotated slightly at the wrist as the plunger is pulled rearwardly, member **30** is extended and bent at the same time and as the slack tends to appear the plunger is moved forward, or released slightly, to permit the action of the weight **40** to pull the member **30** taut. Further, as member **30** is retracted at rather high speed it is a challenge to the operator to try and keep member **30** taut and to keep it moving outwardly again just as it almost reaches complete retraction. Obviously, the many variations in the use are too numerous to set forth herein as it would be the infinite number of patterns derived from selectively shortening and lengthening member **30** while moving the device at various speeds and in sudden changes of direction. The heavier the weight **40** the more strength that is required to move the plunger **42** and to move the entire device once the flexible member **30** begins to wind and unwind so the present invention may be readily used in physiotherapy as a progressive means of rehabilitating damaged hand, finger, arm and shoulder muscles by starting first with a light member **30** and very light weight **40** to regain coordination then changing progressively to heavier weights **40** in order to regain strength.

Although I have shown and described in detail a particular form of my invention it is pointed out that many changes may be made as for example the gear drive arrangement **49**, **50**, **54**, **56** is readily altered by substituting other gears or eliminating some of those present. Therefore I am not limited to the form presented heretofore since the various alterations, substitutions, eliminations, and modifications are within the scope of my invention as defined in the appended claims.

I claim:

1. In a hand manipulated exercise toy, a base member having a portion thereof defined as a gripping portion for part of one hand, a flexible member mounted for constantly controllable extension and retraction on said base member, a weight means on said flexible member adjacent the terminal end thereof, drive means in positive relation with said flexible member in both one direction of movement and in the reverse direction thereof for selectively controlling the speed of movement and extent of extension and retraction of said flexible member, hand control means being the sole control of the movement of said drive means, said drive means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and said retraction stroke, said drive means on substantially the full extension stroke thereof extending said usable length of said flexible member and on the full retraction stroke thereof retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand control selectively controlling the extent of said extensions and retractions.

2. In a hand manipulated exercise toy, a base member having a portion thereof defined as a gripping portion for part of one hand, a flexible member mounted for constantly controllable extension and retraction on said base member, weight means on said flexible member adjacent the terminal end thereof, means movable with successive portions of said flexible member to receive and hold said flexible member in compact condition when retracted on said base member, hand operated plunger means for selectively operating said last named means in a succession of extensions and retractions of said flexible member, said plunger means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, said plunger means on substantially the full extension stroke thereof extending said usable length of said flexible member and on the full retraction stroke thereof retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand plunger selectively controlling the extent of said extensions and retractions.

3. In a hand manipulated exercise toy, a holder adapted to be held in and by a portion of one hand, a flexible member mounted for extension and retraction on said holder, a weight means on the terminal end of said flexible member, hand operated drive means on said holder for positive and selective extension and retraction of said flexible member, said hand drive means being positioned on said holder in such a manner as to be readily operable by a part of the hand as the hand and arm are moved in varied paths and at changing speeds, whereby said flexible member is thrown in a plurality of directions at different lengths of extension, said drive means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, said drive means on substantially the full extension stroke thereof extending said usable length of said flexible member and on the full retraction stroke thereof retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand drive means selectively controlling the extent of said extensions and retractions.

4. In a hand manipulated toy of the class described, a base, a hand actuatable drive means on said base, a mounting means movably mounted on said base and in operable engagement with said drive means, a long, thin flexible member having one end thereof fastened to said mounting means and the other end thereof hanging free of said base member, said drive means retracting said flexible member on said mounting means when actuated by the hand, and weight means on said flexible member exerting force to extend said flexible member on said base when pressure from said hand is relieved and when said drive means ceases to move in a direction of retraction, said drive means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, said drive means on substantially the full extension stroke thereof extending said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand actuatable drive means selectively controlling the extent of said extensions and retractions.

5. In a hand manipulated exercise toy, a base member

having a portion thereof defined as a gripping surface for part of one hand, a substantially long and thin flexible member retractibly mounted on said base, mounting means on said base for receiving said flexible member in retracted condition, hand operated means on said base forcing said flexible member into retraction on said mounting member under pressure from the hand, and pressure means on said flexible member extending said flexible member from said base only when said hand operated means is released from retracting to extending so that said flexible member is selectively extended and retracted according to the application and direction of force from the hand, said hand operated means when applied tending initially to tension said flexible member and said pressure means having the same effect on said flexible member in the opposite direction, said hand operated means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, said hand operated means on substantially the full extension stroke thereof extending said usable length of said flexible member and on the full retraction stroke thereof retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand operated means selectively controlling the extent of said extensions and retractions.

6. In a hand manipulated toy of the class described, a base member having a hand grip thereon, a flexible member movably mounted on said base member for extension and retraction relative thereto, mounting means on said base member receiving said flexible member in retracted condition, a weight mounted on said flexible member and hanging from said base member tending to extend said flexible member from retracted condition, drive means on said base member for driving said mounting means to retract and selectively release said flexible member, hand actuation means on said base member for actuating said drive means through power delivered from the hand, said flexible member being selectively extended and retracted in speed and distance according to whether or not power is exerted from the hand, said drive means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, said drive means on substantially the full extension stroke thereof extending said usable length of said flexible member and on the full retraction stroke thereof retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand actuating means selectively controlling the extent of said extensions and retractions, whereby the path of the flexible member and the weight thereon is determined by the selective actuation of the hand actuation means.

7. In a hand manipulated device of the class described, a pair of opposed side members, a hand grip formed on said side members, a winding member rotatably mounted on said side members, a flexible cord-like member adapted to be wound on said winding member and having a weighted member on the outward terminal end thereof, a plunger supported by at least one of said side members, and drive means in constant engagement between said plunger and said winding member for driving said winding member in direction to wind said flexible cord-like member under pressure from the hand, said plunger being freely movable to reverse direction when released by the hand permitting the weighted member to unwind said flexible member from said winding member, said plunger having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, and said drive means on substantially the full extension stroke of said plunger extending said usable length of said flexible member and on the full retraction stroke of said plunger retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions between said full extension and said full retraction, and said plunger selectively controlling the extent of said extensions and retractions, whereby movement of the device along with selective operation of the plunger will throw the flexible member and weighted member in a diversified path.

8. In a hand manipulated exercise device of the class described, a base member, a winding means mounted on said base member, a flexible member adapted to be wound on said winding member, a weight on one end of said flexible member, a hand grip on said base, a plunger mounted for reciprocating movement on said base and having a portion thereof adjacent the hand grip for actuation by the hand, a drive means in constant engagement between said plunger and said winding means arranged to wind the flexible member in one direction of movement of said plunger, said winding means being unwindable and said plunger being movable in the other direction under pull from said weight on said flexible member, said plunger having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, and said drive means on substantially the full extension stroke of said plunger extending said usable length of said flexible member and on the full retraction stroke of said plunger retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between the full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions between said full extension and said full retraction, and said plunger selectively controlling the extent of said extensions and retractions, whereby moving said device while selectively winding and unwinding causes said flexible member and weight to travel in a varied path.

9. In a hand manipulated toy of the class described, a frame, a hand grip on said frame, a winding means on said frame, a flexible member adapted to be wound on said winding means, a weighted member attached to said flexible member and hanging in such a manner as to be movable in a direction away from said winding means, a winding drive member mounted on said frame in driving relation with said winding means in close proximity to said hand grip so as to be actuatable by a portion of a hand gripping said grip, said drive member being arranged to receive force from the hand to drive said winding means and wind said flexible member against the pull of said weight, while releasing said drive member causes said winding member to be unwound a limited distance by said weight so that intermittent operation of the hand changes the winding and unwinding whereby said flexible member assumes various lengths and directions as the weighted member travels with the end thereof, said drive means having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, said drive means on substantially the full extension stroke thereof extending said

usable length of said flexible member and on the full retraction stroke thereof retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions, and said hand winding drive member selectively controlling the extent of said retractions and extensions and the frequency thereof.

10. In a hand manipulated device of the class described, a chambered body having opposed side walls and a hand grip formed thereon, a pulley rotatably mounted on one of said side walls, a flexible cord-like member having one end thereof fixed to said pulley and having the remainder thereof adapted to be wound on said pulley, a weight member fixed on the terminal end of said flexible cord-like member, a plunger mounted for reciprocating movement inside said chambered body and having a finger grip portion within normal finger reach from said hand grip, a rack formed on said plunger, a shaft rotatably supported on said side walls adjacent said rack, a pinion gear fixed for rotation with said shaft, an intermediate drive gear on said shaft, a second shaft rotatably supported by said side walls and having said pulley fixed thereto, a second pinion gear fixed on said second shaft and being in mesh with said drive gear whereby said weighted member tends to unwind and extend said cord-like member on said pulley thereby moving said rack in

one direction while force exerted on said rack by the hand in the other direction re-winds said cord-like member, said plunger having a cycle of operation consisting of an extension stroke and a retraction stroke for operating said flexible member, said flexible member having an amount of usable length thereof on said extension and retraction stroke, and said drive gear on substantially the full extension stroke of said plunger extending said usable length of said flexible member and on the full retraction stroke of said plunger retracting said usable length of said flexible member whereby said flexible member is confined to selective lengths between said full extension and said full retraction and the object being to keep said flexible member moving in a series of extensions and retractions between said full extension and said full retraction, and said plunger selectively controlling the extent of said extensions and retractions and the frequency thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

580,025	Williams	Apr. 6, 1897
873,784	Reichardt	Dec. 17, 1907
1,906,425	Scott	May 2, 1933
2,428,908	Cooper	Oct. 14, 1947
2,547,776	Rankin	Apr. 3, 1951
2,591,338	Cooper	Apr. 1, 1952