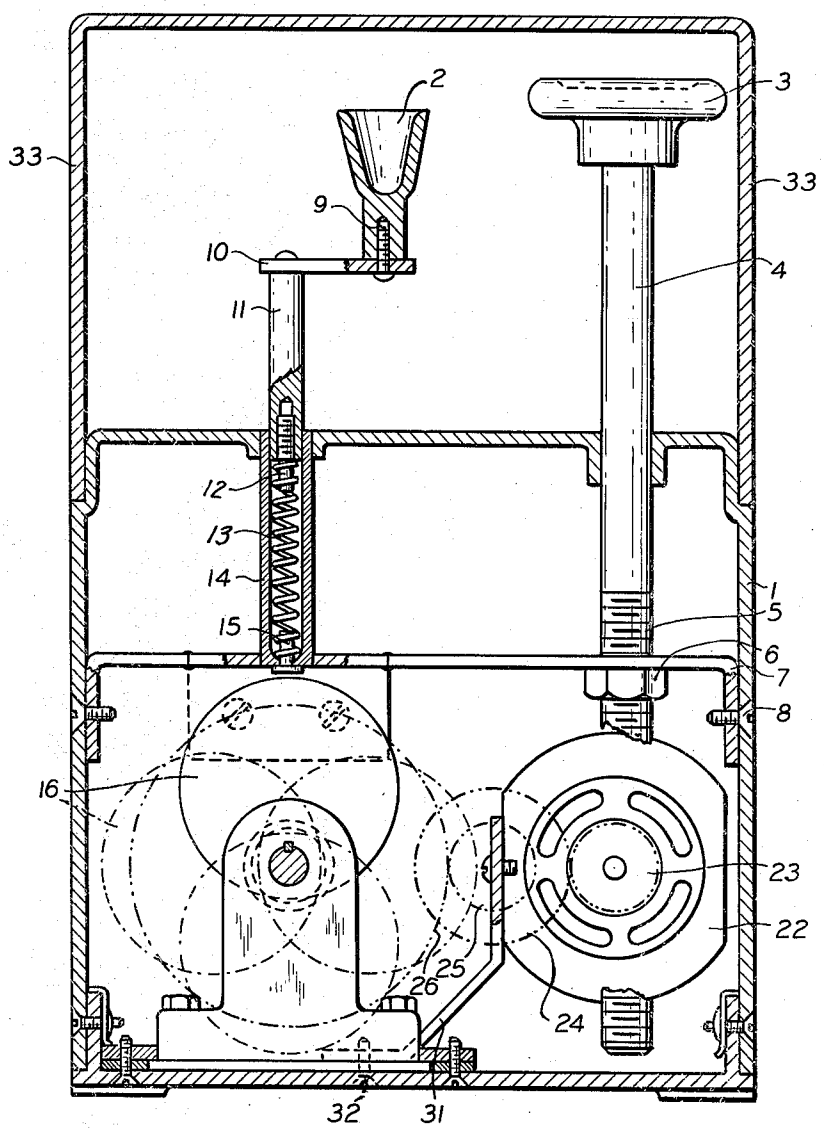
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FINGER EXERCISER

Filed March 20, 1963 3 Sheets-Sheet 1

FIG. 1.



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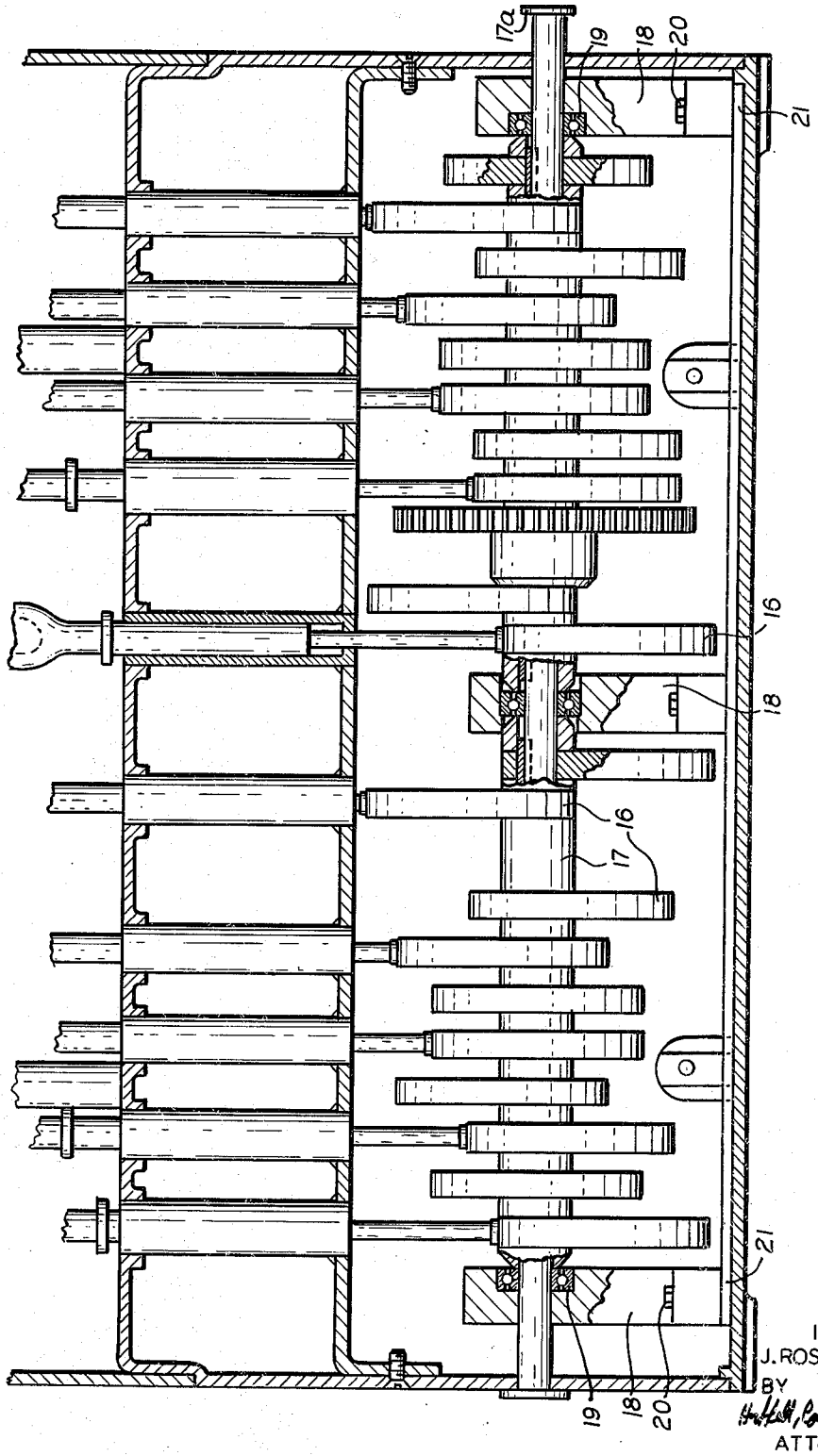


FIG. 2.

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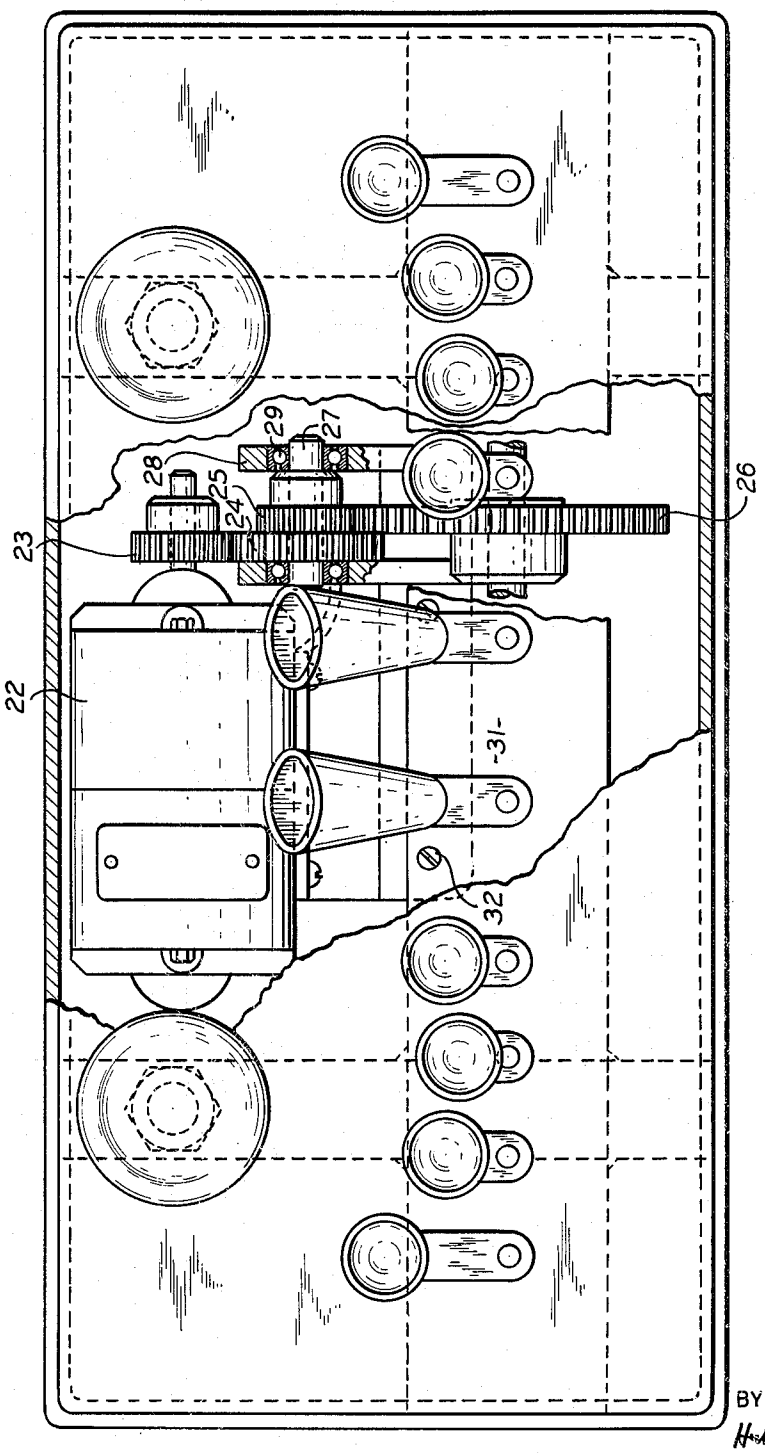


FIG. 3.

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FINGER EXERCISER

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The present invention relates to a finger exerciser and more particularly to a finger-exerciser which would be portable and usable anywhere, being powered with either A.C. or D.C. electric current.

This finger-exerciser could be used with equal benefit by musicians, by people suffering from rheumatism or arthritis, by people whose hands have been injured and need strengthening or by people afflicted with paralysis.

The general object of the present invention is to allow the user to take advantage of the machine without disturbing anyone else in the same room, and without physical effort on his part. For instance, the pianist instead of going up and down the scale endlessly for hours with accompanying discordant sounds, would only have to put both his hands in the machine to have it work his fingers in exactly the same way as they would on the piano keys. In much the same way, a surgeon would be enabled to keep his fingers nimble.

An important object of the present invention is the provision of a finger-exerciser of the character described, which is very simple and inexpensive to manufacture.

Another important object of the present invention is the provision of a finger-exerciser of the character described in which all the component parts may be easily taken apart for cleaning, repairs and the like.

Another important object of the present invention is the provision of a finger-exerciser of the character described which may be used in any position with respect to the vertical, without impairing its functioning.

The foregoing and other important objects of the present invention are achieved by forming a finger exerciser in which a plurality of spaced finger cups are mounted above the top wall of a casing. The finger cups are supported on rods which extend through the top wall of the casing, with the rods subject to rotation about their axes, and axial shifting. Within the casing, a plurality of cam members are mounted on a drive shaft so that rotation of the drive shaft rotates the cam members to impart vertical reciprocation to the rods supporting the finger cups. As a result of this vertical reciprocation of the rods, the fingers of a user inserted in the cups are exercised. Since the rods are subject to rotation, the spacing between the finger cups is adjustable to accommodate different finger spacings on the hands of different users. A palm rest is adjustably mounted above the top wall of the casing on which the user rests the palms of his hands while inserting his fingers into the finger cups.

An important feature of the invention resides in the mounting of the finger cups for rotation about the axes of their support rods to permit selective adjustment of the spacings between the finger cups, thereby accommodating the exerciser to use by individuals having different finger spacings.

Another important feature of the invention resides in the mounting of the drive shaft in the casing for axial shifting of the drive shaft, the drive shaft being provided with a plurality of sets of cams, whereby different sets of cams may be brought into alignment with the finger cup supporting rods to provide different actuation for the finger cups, and different types of finger exercises.

The specific details of a preferred embodiment of the invention, and their mode of functioning will be made most manifest and particularly pointed out in conjunction with the accompanying drawings wherein:

FIG. 1 is a transverse cross section taken through a finger exerciser made in accordance with the teachings of this invention; and

FIG. 2 is a longitudinal cross section, with parts broken away, showing the interrelationship between the drive shaft and the finger cup supporting rods; and

FIG. 3 is a top plan view, with parts broken away of the finger exerciser shown in FIGS. 1 and 2.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, the finger-exerciser, according to the invention, comprises a box like casing **1** which is preferably dimensioned to be about fourteen and a half inches long, seven inches wide and seven inches high. In the illustrated embodiment, ten finger cups **2** are supported at a slight distance above the top wall of the casing. Two palm rests **3** are also arranged above the top wall of the casing preferably on a level with the finger cups, as best seen in FIG. 1. The palm rest is mounted on a supporting post **4** which permits the palm rest to be raised or lowered with respect to the top wall of the casing. This height adjustment is effected by means of threaded end **5** at the lower end of post **4**. The threaded end **5** engages internally threaded nut **6** which is secured to platform **7** of the casing **1**. Platform **7** is mounted in casing **1** by means of screws **8** which pass through downturned flanges on the edges of platform **7** into the side walls of the casing **1**, as best seen in FIG. 1.

The finger cups **2** dimensioned to accommodate the fingers of a user of the apparatus, are mounted by means of a fastening member such as screw **9** on a cantilever arm **10** which is mounted for rotation on rod **11**. Rod **11** is rotatably and slidably supported with respect to casing **1** by means of plunger **12**, which as seen in FIG. **1** has a smaller diameter than rod **11** so that the lower end of rod **11** adjacent its point of securement to plunger **12** forms a shoulder with respect to the plunger **12**. The plunger **12** is surrounded by a coil spring **13**, the upper end of which bears against the shoulder formed by the lower end of rod **11**.

Rod **11**, plunger **12**, and spring **13** are slidably and rotatably encased in sleeve **14** which is supported between the top wall of casing **1** and platform **7**, as seen in FIG. 1. Sleeve **14** is formed with an inturned lower annular flange against which the lower end of spring **13** bears to bias rod **11** upwardly to the position shown in FIG. 1.

At the lower end of plunger **12** is a cam follower **15** dimensioned to move against the camming surfaces of cams **16**, as the cam **16** is rotated.

As can be seen from the drawings, the weight of the user's fingers in the finger cups **2** is employed to exert a compressive force on spring **13** bringing the plunger **12**, and its associated cam follower **15** down against the cams **16**. When finger pressure is released from the finger cups **2**, spring **13** biases the plunger upwardly, as viewed in FIG. 1, so as to bring the cam follower **15** to a position out of contact with the cam **16**, thereby minimizing wear on the cam and cam follower when the finger cup is not being used. Additionally, the requirement that the user exert pressure on the finger cup in order to obtain desired reciprocatory action, implements the attainment of desired exercise functions.

A first set of ten eccentric cams **16** are secured to drive shaft **17**, as best seen in FIG. 2. A second set of cams may also be arranged on the drive shaft **17**. The drive shaft **17** is mounted for axial shifting in casing **1**. Knob **17A** is arranged on the exterior side wall of the casing **1**, and is coupled to the drive shaft **17** to permit manual shifting thereof. As a result of this axial shifting, different sets of cams **16** may be brought into operative alignment with respect to the cam followers **15** so as to provide

different cycles of actuation for the finger cups, thus permitting selective variation of the exercises which may be obtained from the apparatus.

The drive shaft **17**, in the illustrated embodiment of the invention is supported for rotation and axial shifting by means of three bearing supports **18**, and the shaft **17** rotates on ball bearings **19**. Bearing supports **18** are secured by means of fastening members such as bolt **20** to plate **21** which is secured to the casing **1**.

Rotation of the drive shaft is accomplished by means of electric motor **22**. A 1/20 horsepower A.C.-D.C. motor is found satisfactory to obtain desired results. On the drive shaft of motor **22** is a drive gear **23** meshing with an intermediate gear **24**, mounted to rotate with gear **25** which in turn drives driven gear **26** mounted on drive shaft **17**. The intermediate gears **24** and **25** are mounted for rotation on shaft **27** which is supported by bearing supports **28** in ball bearings **29**.

A rheostat, preferably foot operated, is arranged in the electrical circuit to the motor to control the speed thereof.

The motor **22** is supported in the casing by means of plate **31**, contoured as illustrated in FIG. 1, and secured to the casing by means of fastening members **32**.

When not in use the machine can be closed and covered by a cover **33**.

The cups **2** may be easily adjusted to the user's fingers size and can be readily replaced by screwing them on the screw **9**. Adjustment of teh spacing between finger cups **2** is accomplished by moving the cups to desired position by pivoting rod **11** in sleeve **14**.

The coil spring **13** can be made to be of the strength required by the user.

The cams **16** can be shaped to the dimension required by the user and the two movements above described by means of the knob on the shaft **17** can also be made according to the user's specifications.

Provision can also be made to insert dry cell batteries in the casing in order to use the motor **22** with D.C. current.

While a preferred embodiment according to the present invention has been illustrated and described, it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claims.

The embodiments of the invention in which an exclusive property or privilege is claimed, are defined as follows:

1. A finger exerciser comprising: a casing; a drive shaft rotatably positioned in said casing; a set of a plurality of spaced cam members on said drive shaft; a plurality of cam followers positioned in said casing for contact by selective ones of said cam members; a plurality of rods one rod coupled to each one of said cam followers, said rods rotatable about their axes and slidable therealong; and a finger cup mounted on each of said rods, the axis of said finger cup being offset from the axis of said rod, whereby the spacing between said finger cups may be selectively varied by rotating said rods.

2. A finger exerciser as in claim **1** in which spring means are positioned in said casing with a portion of said spring means contacting said rods to normally bias same to a position remote from said cam members when a finger is not inserted in said cups.

3. A finger exerciser as in claim **1** in which said drive shaft is axially shiftable in said casing; a control knob positioned externally of said casing and connected to said shaft to permit axial shifting of said shaft; and a second set of cam members on said shaft which may be selectively brought into alignment with said cam followers when said shaft is shifted.

4. A finger exerciser as in claim **1** in which a post is positioned on said casing, said post having a threaded end at its lower end; a nut on said casing engaging said threaded end of said post, and a palm rest at the upper end of said post, whereby the height of said palm rest with respect to said finger cups may be adjusted.

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