W. C. SCHULZE.

ABDOMINAL EXERCISER.

APPLICATION FILED DEC. 19, 1910.

1,070,924. Patented Aug. 19, 1913.

Fig. 1.

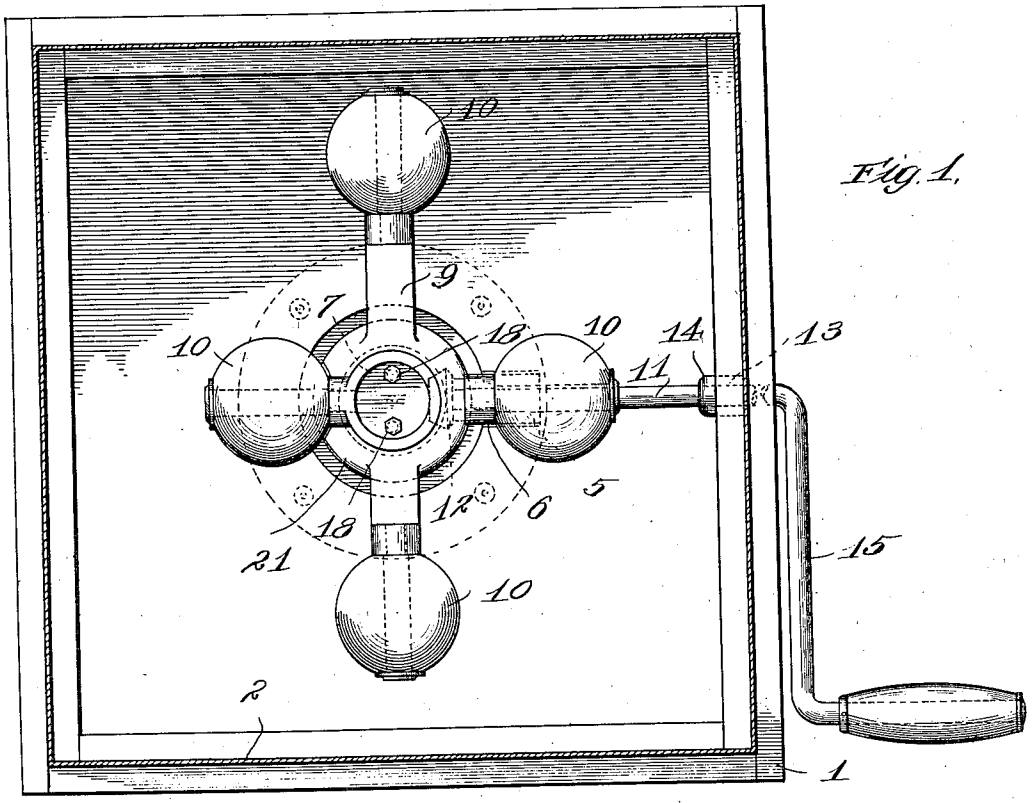


Fig. 2

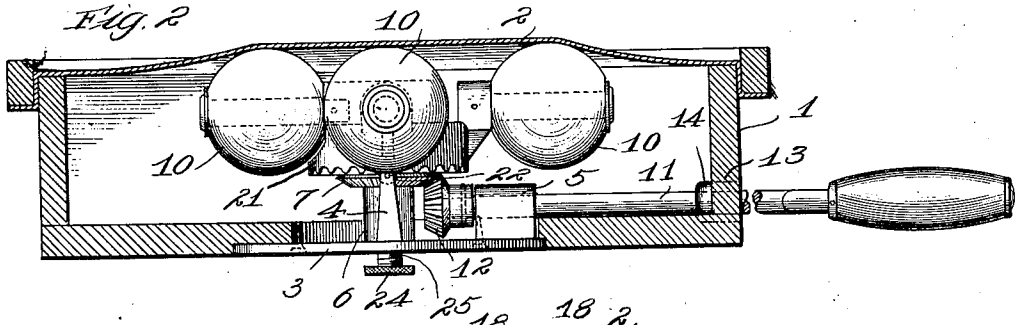
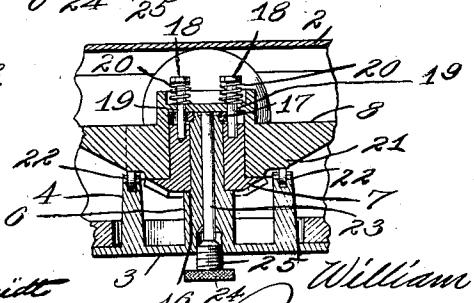


Fig. 3.



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UNITED STATES PATENT OFFICE.

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ABDOMINAL EXERCISER.

1,070,924. Specification of Letters Patent. Patented Aug. 19, 1913.

Application filed December 19, 1910. Serial No. 598,286.

To all whom it may concern:

Be it known that I, WILLIAM C. SCHULZE, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Abdominal Exercisers, of which the following is a specification.

The main objects of this invention are to provide an improved abdominal exerciser to manipulate and massage the abdomen for the purpose of inducing muscular activity and peristaltic action in the intestines; to provide improved means for producing a vibratory motion perpendicular to the abdomen; to provide improved means for regulating the degree of vibratory motion while the apparatus is in operation; to provide an improved construction in which the usual wave motion has superimposed upon it a vibratory motion perpendicular to the abdomen and of higher frequency than the usual wave motion; and to provide an improved construction with adjustable means for tapping or striking smartly the abdomen while subjected to the usual wave motion massage.

A specific structure embodying this invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a sectional view of the abdominal exerciser, showing the rotating mechanism. Fig. 2 is a sectional view, partly in elevation, on the plane of the driving shaft. Fig. 3 shows in detail the adjustable thrust bearing in the center of the main shaft.

Some of the features of the device here described are not broadly claimed herein, since they form the subject matter of applicant's co-pending application, Serial No. 573,664.

In the construction shown, a housing and supports for the rotating elements are formed by a casing 1 and a flexible diaphragm 2 which is the top member for the casing 1. On the bottom of the casing 1 is a fixed plate 3 which has upstanding lugs 4, a main shaft journal 5, and a fixed shaft 6, on which revolves a driven bevel gear member 7, which in turn supports a spider 8 having arms 9 on which are rotatably mounted massaging elements or balls 10.

The driving mechanism comprises a main shaft 11 to which is secured a driving bevel gear 12 meshing with a driven bevel gear 7. The main shaft 11 is supported in the main shaft journal 5 and in an outward bearing 13 which is formed by the shaft coupling 14 where it passes through and engages the casing 1. An operating handle 15 is secured to the coupling 14.

The driven bevel gear member 7 is secured against up and down motion on the main shaft 6 by being confined between a shoulder 16 and a collar 17 which is screw-threaded to and is flush with the top of the main shaft 6. The driven bevel gear member 7 forms a quill shaft for the spider 8. Mechanical connection between the driven bevel gear member 7 and the spider 8 is formed by screws 18 which pass through holes 19 in the top of the spider 8, and are screw-threaded into top of the driven bevel gear member 7. This connection between the driven bevel gear member 7 and the spider 8 permits a rising and falling motion of the spider relative to the driven bevel gear, but does not permit relative rotary motion between the two members. The spider is normally held in contact with the top of the main shaft 6 by means of springs 20 which coact with the heads of the screws 18 and the top plate of the spider 8.

The lower circular shoulder 21 of the spider 8 is indented or provided with teeth located to engage small rollers 22 which are pivotally mounted at the tops of the upstanding lugs 4. When it is desired to operate the spider in such a manner that the indented shoulder 21 will not contact with the rollers 22, then the top plate of the spider 8 can be moved away from the top of the main shaft 6 by compressing the springs 20. The elevation of the spider 8 above the plane of the rollers 22 is accomplished by a solid adjusting shaft 23 which fits in a central bore in the main shaft 6. The solid adjusting shaft 23 is provided with a knurled head 24 and a threaded surface 25 which coacts with a threaded surface in the center of the fixed plate 3.

In operation, the diaphragm 2 of the device is placed to press on the abdomen. The operating crank handle 15, being on the right-hand side of the patient, is in driving relation when turned right-handed, and

turns loose and is separable when turned left-handed. When the handle 15 is turned right-handed, the bevel gears 12 and 7 will turn the rotating spider 8 and the rotatable balls 10 in a left-handed direction. The rotating balls 10 pressing against the diaphragm 2 produce points and lines of stress on the surface of the diaphragm, with an action which is comparatively slow at the center and increases toward the outer edge, giving a wave front which is substantially a spiral with four centers, starting near the center and increasing in velocity toward the outside. Superimposed upon this wave motion is a vibratory motion of the spider 8 and the attached rotating balls 10, which is perpendicular to the abdomen and is caused by the contact between the indented shoulder 21 and the fixed rollers 22. In order that the spider 8 may rotate, it is necessary for the spider to rise high enough to allow the individual teeth of the indented shoulder 21 to pass the roller 22. The perpendicular vibratory motion produces a percussing or striking effect on the abdomen, of a frequency depending on the number of indentations on the shoulder 21. The amount of the tapping or percussing effect can be reduced by the patient by giving the knurled head 24 a right-handed rotation, forcing the top plate of the spider 8 away from the end of the main shaft 6, thus reducing the amplitude of the motion. In case it is desired to entirely stop the superimposed percussing action, the knurled head 24 is turned still farther, until the points of the teeth clear the rollers 22. Hence, it is possible in this improved construction to operate the device as either a simple wave motion machine or as a combined wave motion and percussing action machine, with the percussing action entirely under the control of the operator.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention, as defined by the following claims.

I claim:—

1. In an abdominal exerciser, the combination of a diaphragm, a massaging member having a series of massaging devices behind and in contact with said diaphragm producing stress lines therein, mechanism for rotating said member in a plane substantially parallel with said diaphragm, means carried by said members for imparting thereto a continuous series of vibratory movements transverse to its plane of rotation, and means for regulating the degree of vibratory motion.

2. In an abdominal exerciser, the combination of a diaphragm, a massaging member behind and in contact with said diaphragm producing stress lines therein, mechanism for rotating said member in a plane substantially parallel with said diaphragm, and causing a progressive change of said stress lines, and means actuated through said rotation for imparting to said member a continuous vibratory movement transverse to its plane of rotation.

3. In an abdominal exerciser, the combination of a diaphragm, a massaging member behind and in contact with said diaphragm producing stress lines therein, mechanism for rotating said member in a plane substantially parallel with said diaphragm and causing a progressive change of said stress lines, means for imparting to said member a series of vibratory movements transverse to its plane of rotation, and of greater frequency than the wave motion in the diaphragm resulting from the rotation of said member.

4. In an abdominal exerciser a mechanism comprising a plurality of moving members, a diaphragm stretched over said members, means for actuating said members in circular paths, means for causing said members to vibrate simultaneously and continuously perpendicularly to the plane of rotation thereof, and means for regulating the degree of said vibratory movement.

5. In an abdominal exerciser, a mechanism comprising a plurality of moving members, a diaphragm stretched over said members which is given a regular percussing and a wave motion by said moving members and manually operative means for controlling at will the amplitude of the percussing motion.

6. In an abdominal exerciser, a mechanism housed in a casing, a diaphragm member for said casing, a plurality of rollers mounted on axes normally parallel to said diaphragm, said rollers being adapted to revolve on an axis normally perpendicular to said diaphragm and in contact therewith thereby transmitting a percussing action to the abdomen through said diaphragm, and manually operative means for controlling at will the amplitude of the percussing action.

7. In an abdominal exerciser, a mechanism housed in a casing, a diaphragm member for said casing, a plurality of rollers mounted on axes normally parallel to said diaphragm, said rollers being adapted to revolve on an axis normally perpendicular to said diaphragm and in contact therewith, means for causing said rollers to transmit a continuous percussing action to said diaphragm, and means for adjusting the amplitude of the percussing motion.

8. In an abdominal exerciser, a mechanism housed in a casing, a diaphragm member for said casing, and a plurality of rollers mounted on arms normally parallel with said diaphragm, and movable in concentric

paths, a spider carrying said arms and mounted to revolve on an axis normally perpendicular to said diaphragm and means for causing a rotary and a vibratory movement of said spider to thereby transmit both a kneading motion and a percussing action to the abdomen through said diaphragm.

Signed at Chicago this 16th day of December, 1910.

WILLIAM C. SCHULZE.

Witnesses:
EUGENE RUMMLER,
MARY M. DILLMAN.