Oct. 3, 1967 G. STOLL 3,344,783

DEVICE FOR AUTOMATIC BELT MASSAGE

Filed Dec. 8, 1964 4 Sheets-Sheet 1

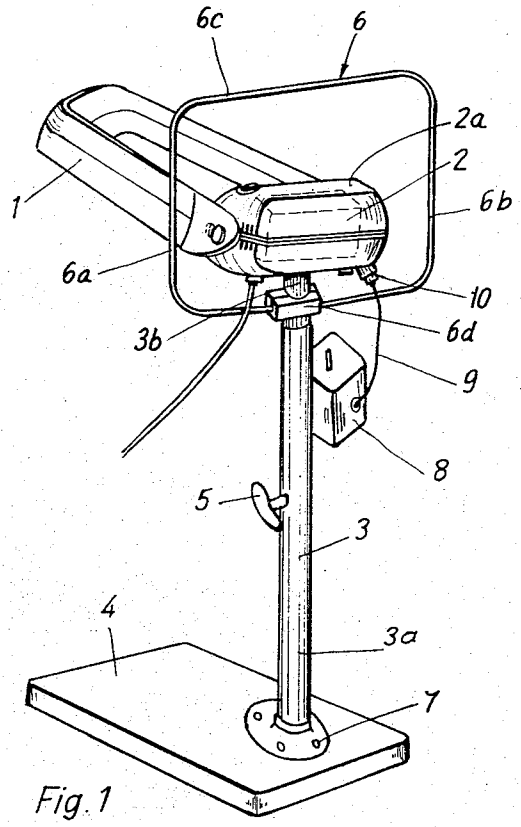


Fig. 1

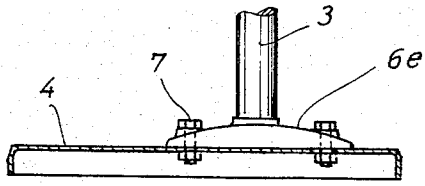


Fig. 2

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DEVICE FOR AUTOMATIC BELT MASSAGE

Filed Dec. 8, 1964 4 Sheets-Sheet 2

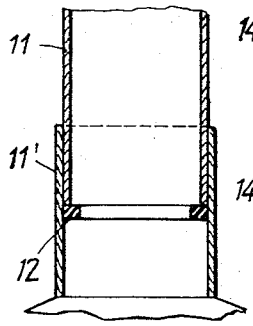


Fig. 3a

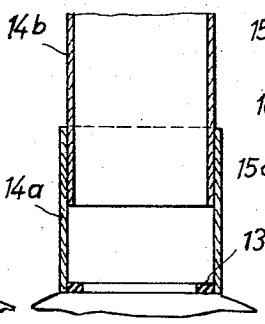


Fig. 3b

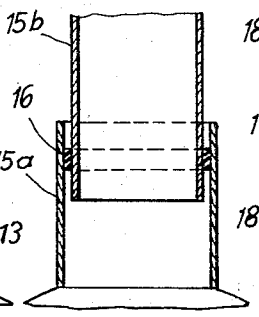


Fig. 4a

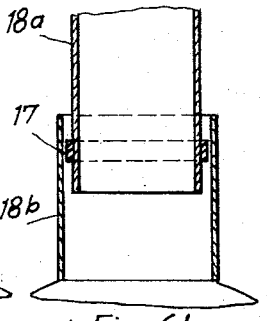


Fig. 4b

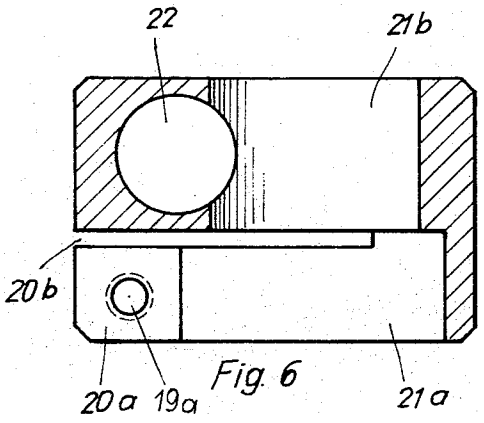


Fig. 6

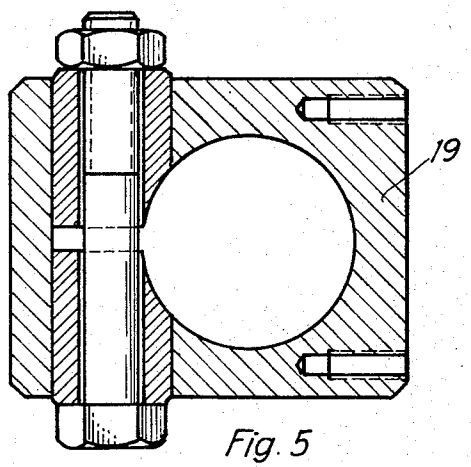


Fig. 5

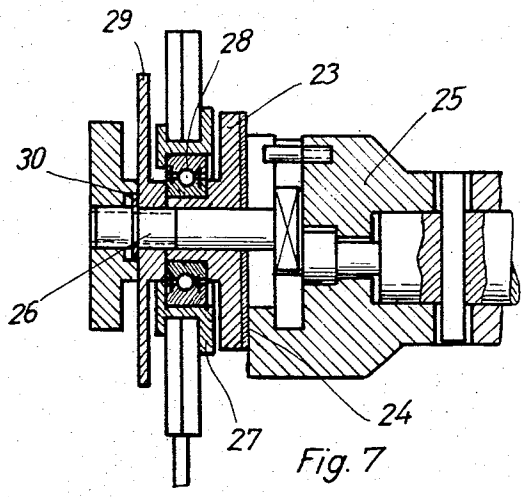


Fig. 7

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DEVICE FOR AUTOMATIC BELT MASSAGE

Filed Dec. 8, 1964 4 Sheets-Sheet 3

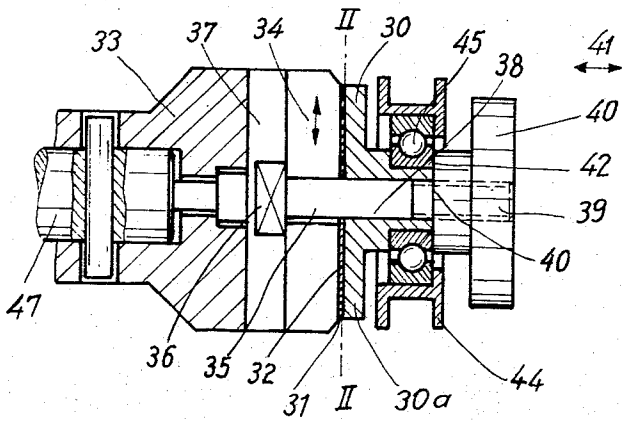


Fig. 8

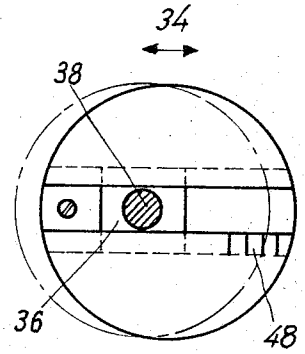


Fig. 8b

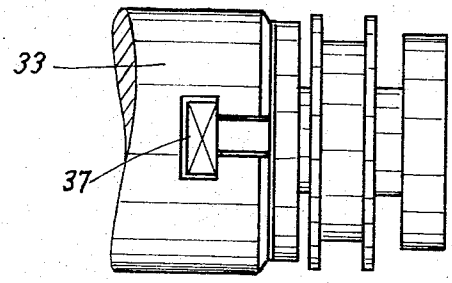


Fig. 8a

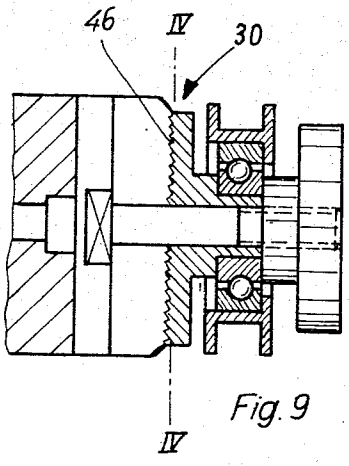


Fig. 9

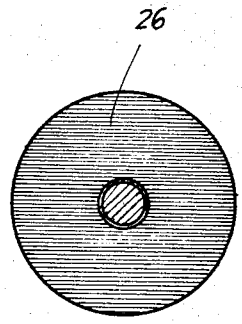


Fig. 9a

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Oct. 3, 1967 G. STOLL 3,344,783

DEVICE FOR AUTOMATIC BELT MASSAGE

Filed Dec. 8, 1964 4 Sheets-Sheet 4

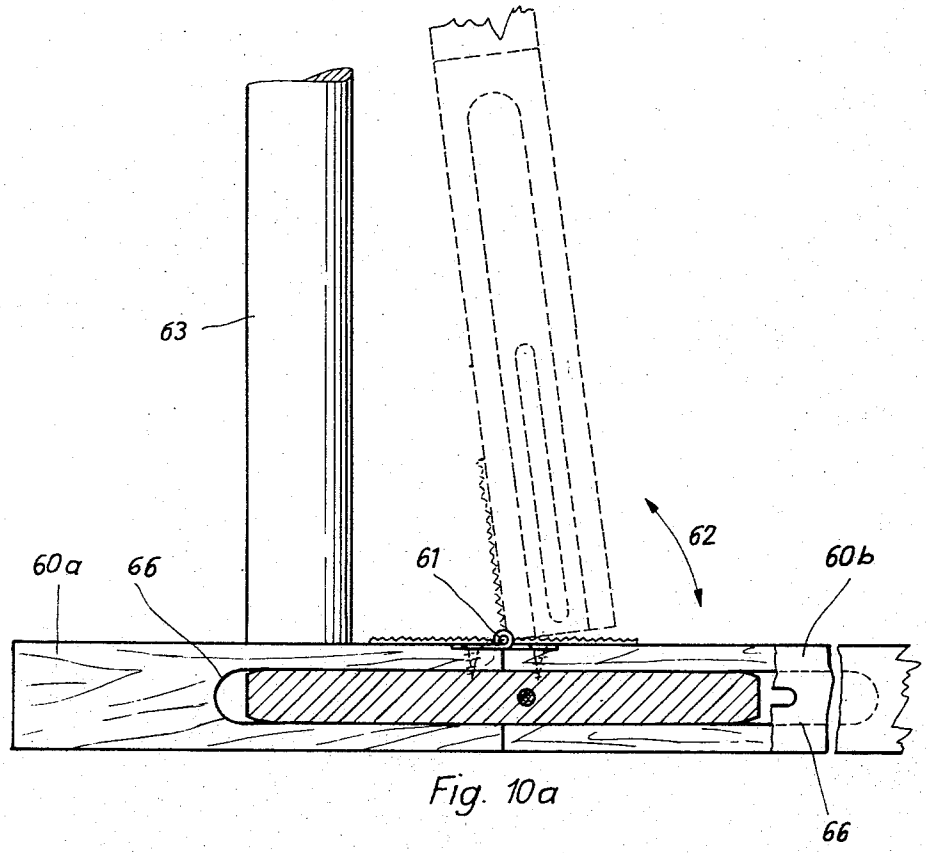


Fig. 10a

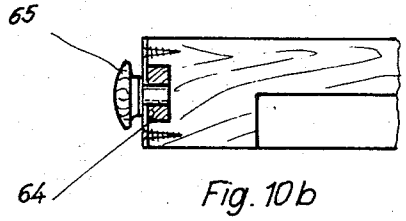


Fig. 10b

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United States Patent Office

3,344,783
Patented Oct. 3, 1967

3,344,783

DEVICE FOR AUTOMATIC BELT MASSAGE

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Filed Dec. 8, 1964, Ser. No. 416,726
Claims priority, application Germany, Dec. 14, 1963, St 16,722
16 Claims. (Cl. 128—63)

The invention refers to a device for automatic message and more particularly to a device of the aforesaid kind comprising a U-shaped massage belt the free ends of which are attached to eccentrics which, in their turn, are mounted on the ends of a drive shaft driven by an electric motor accommodated in a case carried by a carrier column rising from a base plate and arranged crosswise to the longitudinal direction of the said column, the arrangement beng such that the eccentrics can be adjusted by predetermined amounts for changing the eccentricity and can be locked in their respective position.

It is the main object of the invention to provide a device of the aforesaid kind with which the person that is to have a massage can get a fast hold on the device by means of the handle and lean back appropriately, for example, for the massage of the dorsal muscles, whereby the device can be accommodated to the stature of the user.

Another object of the invention consists in to provide a device of the general character described with which the eccentricity can be adjusted as required, whereby it is ensured that the eccentricity chosen is maintained and that the eccentrics do not glide with respect to the drive shaft, even if greater stresses should suddenly occur.

Yet another object of the invention consists in to provide a device of the kind in question which is relatively inexpensive in construction and requires less space than the comparable known arrangements.

A further object of the invention consists in to provide a device of the above described character with which the person using the device can make comfortable use free from any impediment that might be caused by any parts.

A still further object of the invention consists in to provide a device of the aforesaid kind with which from the two tubes telescoped into each other and constituting the carrier column the lower tube receiving the upper one carries on its upper end an advantageously removable clamping block which is slit and can thereby be fixed on the tube and in which the upper tube is displaceably guided which in its respective relative position can be fixed on the block by means of clamping sleeves or shells or a clamping bolt, the said upper tube carrying on its upper end the motor with the handle which is shaped like a U extending upwards in a plane approximately parallel to the plane of the carrier column offset in rearward direction with respect to the central plane of the said carrier column and having two legs that are fixed with their free ends on the carier column and extend on the two front sides of the motor case vertically and are interconnected above the said case by a cross bar running in the longitudinal direction of the said case, and wherein the eccentrics are releasably axially pressed against the drive shaft and bear against front surfaces on the ends of the drive shaft with a surface which is rough having, for instance, grooves running crosswise to the displacement direction of the eccentric or has a so-called friction layer, the associated counter surface on the drive shaft having advantageously also grooves or is covered with a friction layer.

These and other objects, features and advantages of the present invention will become further apparent from the following detailed description thereof, particularly when the same is read with reference to the accompanying drawings, in which:

FIG. 1 is a perspective front view of a device for automatic massage in accordance with the invention;

FIG. 2 shows details of the arrangement according to FIG. 1 in a sectional side view;

FIG. 3*a* and FIG. 3*b* show details of modified embodiments of the invention in a sectional side view, respectively;

FIG. 4*a* and FIG. 4*b* show details of further modified embodiments of the invention in a sectional side view;

FIG. 5 shows another embodiment of the invention in a plan view;

FIG. 6 shows the arrangement according to FIG. 5 in a schematical side view;

FIG. 7 shows a schematical representation of a detail of another embodiment of the invention;

FIG. 8 shows a detail of a further modification of the object of the invention in a vertical side view;

FIG. 8*a* and FIG. 8*b* show the arrangement according to FIG. 8 in a plan view and in a section taken along the line II—II of FIG. 8, and

FIG. 9 shows a modified embodiment of the invention in a partial side view and in a vertical section, whereby

FIG. 9*a* shows the arrangement according to FIG. 9 in a section taken along the line III—III of FIG. 9,

FIG. 10*a* shows another modified embodiment of the invention in a partial side view, and

FIG. 10*b* shows the embodiment of FIG. 10*a* in a front view.

The device for automatic massage in accordance with the invention has—as can be taken from FIG. 1 especially—a massage-belt looped in form of a U. The two free ends thereof are fixed at the ends of a shaft driven by an electric motor **2**. This motor **2** is accommodated in a case **2***a* having the shape of a flat prism. The motor **2** together with its case **2***a* is supported by the carrier column **3** erected on the base plate **4** and adjustable as to the height, for which purpose the column consists of a lower tube **3***a* and an upper one **3***b*, whereby the tubes **3***a* and **3***b* are telescoped into each other and fixable in their respective relative position by means of the screw **5**, as shown in FIG. 1. The handle **6** serves to give the user a solid hold, and it has the shape of a U extending upwards in a plane parallel to the column plane and displaced with respect to the column central plane in the rearward direction. The legs **6***a* and **6***b* with their free ends affixed to the carrier column extend upward at the two front sides of the motor case **2***a* and are interconnected in the area above the motor case by a cross bar **6***c* running in the longitudinal direction of the motor-case. The handle is attached to the carrier column by means of the double attachment clamps **6***d* embracing the column from before and from behind, whereby the handle is conveniently fixed to the rear clamp. The carrier column **3** is arranged on the middle area of the base plate **4** in the vicinity of the rear or backward border thereof.

The column **3** carrying the motor is removably attached to the base plate **4** in accordance with the invention in such a way that it can be taken off together with the motor from above. For that purpose it has at its lower end a flange **6***e* which is slightly curved from inwards and the top in outward direction and towards the bottom and which bears from above against the upper surface of the base plate, and is removably affixed to the latter by means of several, for instance, four screws **7**. These screws can be welded, for example, either to the base plate or to the flange of the carrier column, whereas the counter-part, for example, in form of a nut must be screwed on from above or from below.

The embodiment shown in FIG. 1 is additionally provided with a coin apparatus designed as cubical or prismatic box which, when inoperative, locks the motor against actuation and which upon actuation by inserting

a coin of the desired value gives free the motor. This coin operated apparatus is arranged on the lower tube 3*a* of the carrier column and is in connection with the drive motor **2** by means of a cable **9** which is disengageably connected with the drive motor by means of a plug and socket connection as indicated at **10**. Thus, the two tubes of the device can be disengaged and separated without removing the motor first: it is now sufficient to disconnect or loosen the connection **10** only.

FIG. 3*a* shows an embodiment in which provision is made for damping the impacts or vibrations that may occur whenever the upper tube **11** is rapidly gliding down after the set screw is loosened. To this purpose, the lower end of the upper tube **11** mounted within the lower tube **11'** is provided with a ring-shaped resilient pad made of rubber or a similar elastic material. The arrangement according to FIG. 3*b* serves to the same purpose. In that case, however, the ring pad **13** made of rubber or elastic material is arranged on the lower surface of the lower tube **14***a* serving to guide the upper tube **14***b*.

With the embodiments according to FIGS. 4*a* and 4*b* provision is made in order that between the two tubes may not exist too great a clearance during the adjustment as to the height, for such clearance would eventually lead to disagreeable and unwelcome noise. For that purpose the embodiment according to FIG. 4*a* is provided on the inner side of the lower tube **15***a* serving to guide the upper tube **15***b* with a ring **16** of rubber or rubber-like material which serves to bring about a tight fit of the two parts into each other during their displacing movement. The ring of the embodiment shown in FIG. 4*b* has the same purpose, but in that case the ring **17** is arranged on the outer side of the upper tube **18***a* which is displaceably mounted within the lower tube **18***b*. Instead of a ring, use can be made also of a collar or the like made of rubber or rubber-like material.

With the embodiment according to FIGS. 5 and 6 there is used an especially convenient arrangement for fixing the two tubes in their relative position. The lower tube carries on its upper end a clamping block **19**, which has a cross-slit **20***a*. Due to the longitudinal slit **20***b*, the block can be clamped onto the lower tube with the greater diameter by means of a screw which can be passed through the bore-hole **19***a*. It is easy to realize that the partial boring **21***a* associated with the lower tube has a greater diameter than the partial boring **21***b* associated with the upper tube. The upper tube and the clamping block **19** are secured or clamped to one another as usual by means of clamping bolts or clamping shells for which purpose there is provided the bore **22**.

Additionally there has been developed an embodiment of the invention with which there is provided a safety arrangement to prevent stealing of the massage-belt. This is necessary, if the device is mounted for public use. Hereby, the one end of the massage-belt is removably attached to the one end of the shaft of the driving motor, whereas the other end of the belt is secured to the other end of the shaft by means of a screw which can be loosened only by means of a special spanner. In FIG. 7 there is, finally, shown a further embodiment of the above safety arrangement. As is known, the drive motor imparts to the massage belt by means of the eccentrics **23** the relative position of which with respect to the driving shaft can be changed to a to and fro going vibrating motion utilized for the massage. These eccentrics bear with their one surface through the medium of the friction layer **24** against the fastening head **25** and are pressed thereagainst by means of the screw **26**. The one end of the massage-belt is removably slipped onto the ring **27** on the ball bearing **28**, whereas the other end thereof is additionally held by a securing disk secured itself against removal by means of the spring ring **30**.

The drive motor to be conveniently used is a single-phased motor with a low speed, e.g. of about 900 revolutions per minute, which drives the shaft directly without interposing a reduction gear or a gear gearing the speed up, said shaft carrying on its two ends eccentrics to which the ends of the massage-belt are attached. The speed of the drive motor is thereby so chosen that the maximum of efficiency is obtained.

The FIGURES 8 and 9 show an embodiment of the invention in which the eccentrics **30** are axially clamped to the shaft in such a way that the connection can be easily severed off at any time. Hereby, they bear against front surfaces on the ends of the driving shaft with a surface which is rough, for example, acccording to FIGS. 9 and 9*a* in form grooves or the like and according to FIGS. 8 and 8*a* is covered with a friction layer. Under certain circumstances, the counter-surface on the associated front end of the drive shaft can also be rough or covered with a so-called friction layer. The carrying layer can be very thin and may have, for instance, a thickness of 1 mm. only. With the embodiment according to FIG. 8 the contact-surface of the eccentrics **30** is totally covered by a friction disk **31**. Hereby, the eccentric consists of a cylindric piece the base of which—which is provided on an annular flange which on its outer side carries the friction layer—bears against the counter-surface **32** of the fastening head **33** on the associated axial front end of the drive shaft provided also with a friction layer. The aforesaid cylindric piece can be radially displaced according to the arrow **34** with regard to the driving shaft and can be fixed in its respective position. Its longitudinal axis remains permanently parallel to the axis of the drive shaft, whatever position may be chosen. The eccentric is removably fixed on the associated fastening head **33** of the drive shaft by means of the screw **35**. The square head **36** of that screw is displaceably guided in a T-slot **37** in direction of the arrow **34** which runs in radial direction and is open on its outer end. The shaft **38** of the screw **35** is centrically arranged and goes axially through the eccentric. On the end **39** of the screw provided with exterior thread there is arranged a fixing nut that can be screwed to and fro according to arrow **41** and which bears with its inner surface **42** against the eccentric. The nut is designed as knurled nut. If required, a friction layer can be provided between the inner surface of the fixing nut and the eccentric, as indicated at **43** in FIG. 8. This layer may belong to a washer or may be provided on the inner surface of the fixing nut. In this latter case shown in the drawings the surface of the eccentric facing the fixing nut is also covered with a friction disk. On the periphery of the eccentric a ring **44** is rotatably supported by means of a ball bearing **45** onto which the ends of the massage-belt are slipped. The premise for a perfect functioning of the arrangement consists in that the support of the friction layer is as broad as possible. The knurled nut must be in a position to perfectly fix the head to the shaft and not to be loosened by the vibrations of the ball bearing which is slipped onto the eccentric with pinch fit. Conveniently, the screw is ground or polished in order to be easily displaceable on the eccentric without shaking or canting.

The individual elements of the arrangement according to FIG. 9 correspond, with one exception, to those of the arrangement according to FIG. 8, wherefore the same parts are marked with the same numerals. However, with this arrangement there is provided instead of a friction layer a rough contact or bearing surface. This roughness consists of grooves **46** which run approximately across the displacement direction of the eccentric.

To adjust the eccentricity of the eccentric, with both embodiments the eccentric is displaced to and fro along the bearing surface **32** according to arrow **34** by the desired amount. The consequence of that procedure is that the longitudinal axis of the drive shaft is arranged at a certain and desired distance to the longitudinal axis of the eccentric, whereafter, the eccentric is fixed in its position by tightening the screw. The grooves of the embodiment

according to FIG. 9 or the friction layer of FIG. 8 ensure that the eccentric can not get loose from the contact or bearing surface by itself. In the embodiments according to FIGS. 8 and 9 the eccentric is shown in a concentric position with respect to the drive shaft, whereas FIG. 8*b* shows how the eccentric with the shaft of the screw **35** may be arranged eccentrically with respect to the drive shaft **47** connected with the fastening head **33** and how a scale with a graduation **48** may be used for the adjustment of the eccentricity of the eccentric with respect to the driving shaft.

In the embodiment partially shown in FIGS. 10*a*, 10*b* the base plate consists of two halves **60***a*, **60***b* linked to one another as at **61** so that the half portion **60***b* may be pivoted up and down about the axis **61** according to arrow **62**. The column **63** is so positioned on half portion **60***a* that the apparatus is stable without tilting over even after pivoting the half portion **60***b* into its upper position shown in dotted lines. In this position, the apparatus can be stored—when not needed—without requiring too much room. For locking the halves **60***a*, **60***b* in their horizontal position shown in full lines, the slide **64** with the handle **65** is provided which is slidable in the groove **66** and which in its position shown in FIG. 10*a* locks half **60***b* against pivotment about axis **61** and in its right hand position permits this pivotal movement.

Although my invention has been illustrated and described with reference to the preferred embodiments thereof, I wish to have it understood, that it is in no way limited to the details of such embodiments, but is capable of numerous modifications within the scope of the appended claims.

Having thus fully disclosed my invention, what I claim is:

1. A device for automatic massage comprising in combination: a base plate, a carrier column rising vertically from the said base plate, the said carrier column being constituted of two tubes telescoped into each other, the lower tube receiving the upper one for up and down gliding movement; an electric motor, a case containing said electric motor and arranged crosswise to the said longitudinal direction of the said carrier column, said case and said motor being carried by said upper tube of said carrier column; a drive shaft driven by the said electric motor and extending on both sides of said motor; eccentrics mounted on the free ends of the drive shaft for movement with respect thereto in a direction transverse to the axis of the drive shaft to change their eccentricity, said eccentrics having roughened surfaces, and means to lock the eccentrics releasably in their adjusted positions, said locking means including means axially pressing the eccentrics against front surfaces on the ends of the drive shaft, such front surfaces being roughened, a U-shaped massage belt the free ends of which are attached to the said eccentrics; a U-shaped handle extending upwards in a plane parallel to the said carrier column and offset in rearward direction with respect to the central plane of the said carrier column, said handle having two legs that are fixed with their free ends on the said carrier column and extend vertically on the two front sides of the said motor case, said handle having also a cross bar running in the longitudinal direction of the said case containing the said motor and being situated above the said case thereby interconnecting the said legs of the said handle; whereby the lower tube of the said carrier column carries on its upper end a removable slit clamping block in which the said upper tube of said carrier column is guided, whereby the said upper tube can be releasably affixed to the said block with the aid of clamping means.

2. The device set forth in claim **1**, wherein the carrier column is removable attached to the base plate so that it can be taken off together with the motor in upward or downward direction, by carrying on its lower end a flange slightly curved from its center to its periphery and from its top to its bottom and bearing from above against the upper surface of the base plate and being releasably connected therewith.

3. The device set forth in claim **1** having a coin operated means which in its inoperative situation locks the motor against actuation and releases it after insertion of a coin having the desired value, wherein the said coin operated mechanism is constructed as a prismatically shaped box and is secured to the lower tube of the carrier column and is connected with the drive motor by means of a cable which is releasably connected with the drive motor through a plug and socket connection.

4. The device set forth in claim **1**, wherein on the lower end of one of the two tubes there is provided a resilient pad of rubber or like elastic material.

5. The device set forth in claim **1**, wherein one of the two tubes carries a sleeve made of material with rubber-like qualities on the side facing the other tube.

6. The device set forth in claim **1**, wherein the contact or bearing surface of the eccentric and the counter-surface on the front side of the drive shaft are at least partially covered each by a disk consisting of a friction layer.

7. The device set forth in claim **1**, wherein the eccentrics consists of a cylindric piece the base of which bears against a plane contact or bearing surface of a fastening head on the associated axial end of the drive shaft, and which can be displaced therealong radially with respect to the drive shaft and fixed or locked in the respective required position and the longitudinal axis of which runs in every position parallely to the axis of the drive shaft.

8. The device set forth in claim **1**, wherein on the periphery of each cylindric eccentric there is supported by means of ball bearings a ring, the ends of the massage-belt being slipped thereonto.

9. The device set forth in claim **1**, wherein the handle is fixed on the carrier column by means of double attachment clamps which embrace the carrier column from before and behind, whereby the handle is attached to the rear clamp and the carrier column conveniently erected in the vicinity of the rear border of the base plate within the medium area thereof.

10. The device set forth in claim **1**, wherein as driving motor a single-phased motor with a low number of revolutions is provided which drives directly, i.e. without the insertion of any gear gearing up the speed or any reduction gear the driving shaft which on its ends carries eccentrics on which the ends of the massage-belt are attached.

11. The device set forth in claim **1**, wherein the contact or bearing surface of the eccentric and the counter-surface on the front side of the drive shaft are roughened by having grooves running across the displacement direction of the said eccentrics.

12. The device set forth in claim **1**, wherein the said base is constituted of two halves of which the one is pivotable up and down about a horizontal axis, said halves being fixable against one another in their horizontal position.

13. The device set forth in claim **12** wherein the said column is so positioned on one of the said half portions that the apparatus is stable without tilting over even after pivoting the other half portion into its upper position.

14. The device set forth in claim **7**, wherein the eccentrics are removably fixed to the associated fastening head of the drive shaft by means of a screw, the square head of which is axially displaceably guided in a slot extending radially on the fastening head and open on its outer side, the shank of which is centrically arranged and passes axially through the eccentric and on the free end of which provided with an exterior thread is arranged a fixing nut which can be screwed thereon up and down

and bearing with its inner face against the eccentric, wherein between the eccentric and the inner surface of the fixing nut, a friction layer is provided which is allotted to a friction layer on the surface of the eccentric facing the fixing nut.

15. The device set forth in claim **14**, wherein the said friction layer between the said eccentric and the inner surface of the said fixing nut belongs to a washer interposed therebetween.

16. The device set forth in claim **14**, wherein the said friction layer between the said eccentric and the inner surface of the said fixing nut is provided on the said inner surface of the said fixing nut.

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RICHARD A. GAUDET, *Primary Examiner.*

L. W. TRAPP, *Examiner.*