Dec. 7, 1965 G. S. BRADLEY 3,221,349

MATTRESS DEPRESSOR

Filed Dec. 9, 1963

FIG. 1

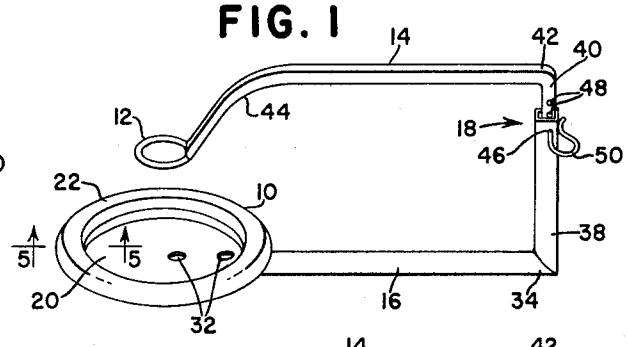


FIG. 5



FIG. 4

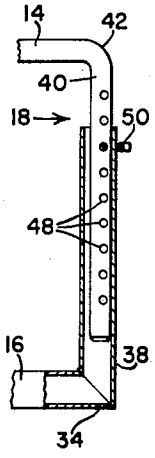


FIG. 2

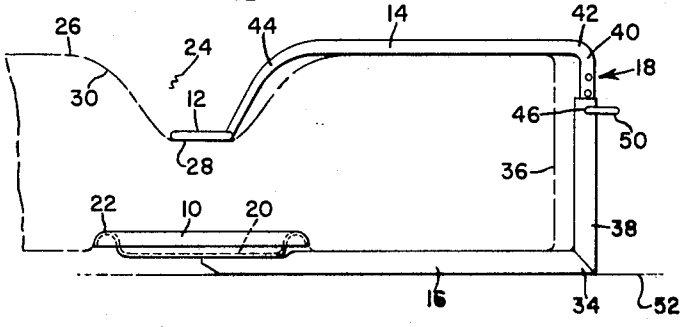


FIG. 3

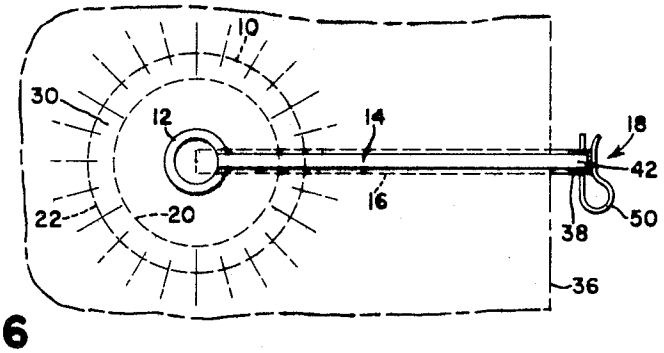


FIG. 6

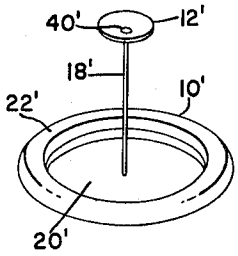


FIG. 8

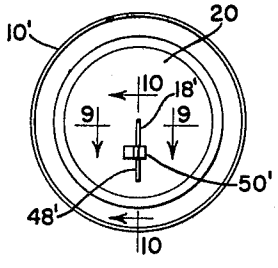
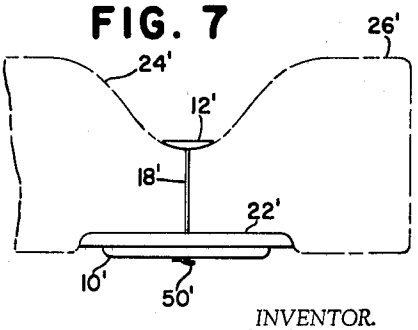


FIG. 7



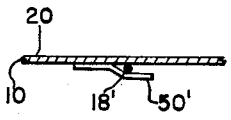


FIG. 9

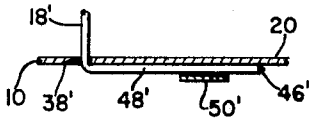


FIG. 10

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MATTRESS DEPRESSOR

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13 Claims. (Cl. 5—317)

This invention relates to a mattress depressor which finds particular utility in creating depressions in upper portions of mattresses to render such mattress more comfortable to the users thereof. More particularly the invention aims at improving the mattress for bed patients, invalids, etc., by depressing the mattress in one or more localized areas and thereby avoiding undesirable pressures on certain parts of the patient's anatomy.

For example, a person lying flat on his back for a prolonged period will experience tenderness in his heel areas because of the localized support of his legs primarily on his heels. Similarly, other bony structures are affected by long periods of supporting weight where movement of the affected part is limited. Prior attempts to solve these problems have been devoted mainly to pillows, pads, inflated rings, etc., but these have proven to be undesirable because of bulk, lack of stability, high cost and short life and the like.

According to the present invention, a novel approach is made on the basis of a device by means of which a selected area of a mattress may be depressed, thus affording a controlled depression which receives the vulnerable part, thus transferring the weight-supporting task to another body part better suited for the purpose. For example, in the instance of the formation of a depression for a person's heel, the support of the leg is transferred to the fleshy and muscular part of the back of the leg, immediately eliminating tenderness in the heel and in general improving the overall condition of the patient.

It is an important object of the invention to provide a simple form of device which may be economically constructed of long-life, durable materials as distinguished from rubber, fabric, etc., and to associate with this device upper and lower pressure members which engage respectively selected upper and lower surface portions of the mattress to compress the mattress therebetween, the upper element having a much smaller area than the lower so that the desired depression occurs solely in the top of the mattress. A still further object of the invention resides in the means whereby the vertical depressing force is applied between the two elements, in one case the means comprising a flexible wire-like tension member penetrating the mattress and connected to the elements, and in the other case the means including arms respectively connected rigidly to the elements and extending laterally to a releasable connection beyond the edge of the mattress. It is a feature of the invention that, in either form of the device, the elements may be disconnected and used over and over, being preferably constructed of stainless steel or plated metal and thus being easily maintained, sterilized, etc.

A further object resides in the shapes of the cooperative elements whereby the depression in the mattress is controlled so as to secure a desirable configuration thereof.

The foregoing and other important objects and desirable features inherent in and encompassed by the invention will become apparent as two embodiments thereof are disclosed in detail, by way of example, in the ensuing description and accompanying sheet of drawings, in which:

FIG. 1 is a perspective of one form of the device, shown assembled and apart from the mattress;

FIG. 2 is an elevation, showing the device in use on a mattress, the latter being shown in dot-dash lines in the interests of simplicity and clarity;

FIG. 3 is a top plan of FIG. 2;

FIG. 4 is an enlarged fragmentary view, partly in section, showing the connection means between the upper and lower elements;

FIG. 5 is an enlarged fragmentary section on the line 5—5 of FIG. 1;

FIG. 6 is a perspective of another form of device, shown assembled and apart from a mattress;

FIG. 7 is a view comparable to FIG. 2;

FIG. 8 is a bottom plan view of the device of FIG. 6;

FIG. 9 is an enlarged fragmentary section on the line 9—9 of FIG. 8; and

FIG. 10 is an enlarged fragmentary section on the line 10—10 of FIG. 8.

FIGS. 1–5

In this form of the invention, the device includes a bottom plate-like element **10**, an upper button-like element **12**, upper and lower arms **14** and **16**, respectively, and connection means **18** for releasably interconnecting these arms.

The element **10** is preferably circular and of stainless steel or plated metal for ready hospital acceptance, and has a generally flat central top portion **20** bordered by an annular marginal upstanding rib **22**. As will be brought out below, this configuration, plus the difference in area between the two elements **10** and **12**, is instrumental in controlling the mattress so as to enable the achievement of a depression of desired shape.

In one form of the invention, the diameter of the element **10** may be on the order of six to ten inches while that of the element **12**, which is here a circular ring, may be on the order of one to three inches. These dimensions are, of course, given by way of examples, for other sizes could be used, but it should be observed that the element **10** has an effective mattress-engaging area substantially greater than that of the element **12**. In this instance, and using an element **10** diameter of 6¾" and an element **12** diameter of 1.54", the area of element **10** is some twenty times larger than that of element **12**. Variations on both sides of this ratio are of course permitted, depending upon the size of the mattress depression desired. The illustrated device is primarily useful in creating a depression of the Such depressions are well adapted to accommodate, say, a size and shape shown at **24** in a mattress **26** (FIG. 2). person's heel, it being noted that the depression has a bottom **28** and an upwardly and outwardly sloping annular wall **30**, giving the depression a crater-like form. This is largely due to the annular rib **22** on the element **10**, which concentrates the forces at the bottom of the mattress into a comparable circle or ring so that the sides of the "crater" form more of a cup rather than a large-diameter "saucer."

It should also be understood that the installed device will be covered by further bed clothes, at least a sheet, to cover the ring or element **12** so as to avoid direct contact with the patient's body. Further, and looking at FIG. 3, the patient will be lying normal to the lateral extent of the arms **14** and **16** and the arm **14** will not interfere with his foot or leg.

The arm **16** is rigidly secured to the bottom of the element **10**, as by a pair of screws **32**, and is adapted to extend laterally beneath the mattress to a terminal end portion **34** beyond the proximate edge **36** of the mattress. The length of the arm **16**, as well as that of the arm **14**, is based on the desired position of the mattress depression **24**, and this of course will vary with the conditions for which a particular device is designed.

Rigidly secured to and rising from the end portion **34** of the arm **16** is a hollow leg **38** which, with a telescopi-

cally received vertical leg 40 on the terminal end 42 of the upper arm 14, comprises part of the connection means 18. The inner end of the arm 14 is shaped with a downward and inward neck 44, to accommodate the mattress depression 24, and is secured as by welding to the upper element 12. The leg 38 has near its upper end a pair of transversely alined openings, one of which is visible at 46, and the leg 40 on the arm 14 has a series of vertically spaced apart openings 48, any selected one of which may be alined with the pair of openings 46 for receipt of a removable lock element 50.

When the lock element or member 50 is withdrawn, the telescopic connection is freed to allow the two halves of the device to be moved apart enough to enable the arms 14 and 16 to be positioned respectively over and under the mattress, the lower arm of course being inserted between the bottom of the mattress and the spring or other mattress support, as at 52 (FIG. 2). Downward manual force applied to the arm 14 in the area of its midpoint will push the leg 40 downwardly into the hollow upright leg 38 of the arm 16 until the desired depth of the depression at 24 is attained, following which the pin or element 50 is inserted in the appropriate holes 46–48 to retain the locked position of the parts. It will be understood that the lower leg 16 will normally be resting on the spring or other mattress support 52 so that application of downward force on the arm 14 is a relatively easy task. Also, the matter of achieving the lock at 46–48–50 is facilitated by the fact that the resisting or spring-back force of the mattress occurs mainly along the line of coaxiality of the elements 10 and 12 and thus tends to cock the leg 40 in the leg 38, creating enough friction to relieve the user of at least part of the job of resisting mattress spring-back while at the same time trying to line up the openings 46 and 48. By the same token, to release the device, pressure may be applied to the arm 14 midway between the leg 40 and ring or element 12, and this will suffice to free any bind on the pin 50 as well as between the telescopic legs.

In FIG. 3, the broken radial lines are used to illustrate the general uniformity of the shape of the depression at 24.

It will be apparent that the provision of the several openings 48 in the leg 40, together with the lengths and telescopic fit of the legs 40 and 38, adapts the device to mattresses of different thicknesses.

FIGS. 6–10

The device shown here has the basic characteristics of that described above, with the chief difference residing in the means for exerting force between and for interconnecting the elements. The basic elements appear at 10′ and 12′, the former having the same configuration as element 10 in that it has the flat central part 20′ and marginal rib 22′ (compare FIG. 5) but instead of being drilled to receive the cap screws 32 it has a single central aperture 38′.

The element 12′ is a concavo-convex disk, used with its concave side down, and has a central aperture, not shown, through which is downwardly passed a wire-like connecting and force-exerting member 18′, headed at 40′, to prevent downward withdrawal from the element 12′, and preferably sharpened at its lower end at 46′ (FIG. 10) to facilitate its penetration of and insertion through the mattress 26′. This wire is of course threaded through the lower element aperture 38′ and a combination of downward pressure from above on the element 12′ and tension on the wire 18′ draws the element 12′ downwardly to create the mattress depression 24′, the control ring 22′ functioning as in the case of the ring 22 to secure a proper depression. The free end of the wire is then pulled laterally in bent fashion at 48′ beneath the element 10′ and retained by drawing it at right angles to the bent portion 48′, which engages it with a clip or lock member 50′ welded to the bottom of the element. This clip is designed to provide a wedging action on the wire which serves to retain it against pulling out by the spring-back in the mattress.

In practice, it will be found that this device can be used over and over on the same mattress, for the punctures made by the wire in the mattress cover are minor, and the holes through the interior of the mattress are insignificant. The length of the wire may be such as to adapt it to mattresses of different thicknesses. Proper selection of the wire material assures long life despite possibly frequent bending and straightening for locking and unlocking. Further, the wire is an inexpensive part and may be easily replaced.

SUMMARY

Both forms of the device have in common the basic concept of being able quickly, easily and economically to form desired depressions in mattresses. The structure in either case is simple, requires little skill in use, and is clearly hospital-acceptable because of the selection of material and cleanness of design.

Features and advantages other than those enumerated herein will readily occur to those versed in the art, all of which may be exploited without departing from the spirit and scope of the invention.

What is claimed is:

1. A mattress depressor for a mattress on which an invalid person or the like is reclining so as to provide in the top of such mattress a localized depression capable of receiving and alleviating distress in a body part of such person, comprising: a lower plate-like element adapted to engage generally flatwise a portion of the bottom of a mattress spaced a substantial distance inwardly from the marginal edge of such mattress, an upper button-like element adapted to engage the upper surface of the mattress at a portion thereof in vertical alinement with said bottom element, said bottom element having a mattress-engaging area subsantially greater than that of said upper element, and means operatively connected between the elements for exerting a vertical force between the elements to hold the upper element downwardly toward the bottom element and thereby to create a substantial depression in the upper surface of the mattress centered about said upper element.

2. The invention defined in claim 1, in which: the area of said bottom element is on the order of fifteen to twenty-five times greater than that of the upper element.

3. The invention defined in claim 1, in which: said upper element is circular.

4. The invention defined in claim 1, in which: the force-exerting means is a vertical member connected centrally to the upper element and passed downwardly through the mattress and connected to the bottom element.

5. The invention defined in claim 4, in which: the bottom element has a central aperture therein, said member is wire-like and is passed through said aperture and drawn taut, and said bottom element has means additional to the aperture for engaging and retaining said member.

6. The invention defined in claim 1, in which: the force-exerting means comprises upper and lower lateral arms rigidly secured respectively to said upper and lower elements and adapted respectively to extend over and under the mattress to vertically alined terminal end portions closely beyond said edge of the mattress, and releasable connection means interconnecting said terminal end portions and normally effective to retain the downward status of said upper element.

7. The invention defined in claim 6, in which: said connection means includes vertically telescopically associated legs rigidly secured respectively to said terminal end portions and a removable lock member for selectively connecting and releasing said legs.

8. The invention defined in claim 7, in which: one of said legs has an opening therethrough and the other leg has a series of vertically spaced openings therethrough of which a selected opening is transversely alinable with the opening in said one leg, and said lock member is insert-

able through and withdrawable from such alined openings.

9. The invention defined in claim 1, in which: said bottom element is circular and has a generally flat central portion and an annular marginal upstanding rib.

10. The invention defined in claim 1, in which: said upper element is a circular ring.

11. The invention defined in claim 1, in which: said upper element is a circular concavo-convex part disposed with its concave side downwardly.

12. A mattress depressor for deforming a mattress on which an invalid person or the like is reclining so as to provide in the top of such mattress a localized depression capable of receiving and alleviating distress in a body part of such person, comprising: upper and lower elements arranged in vertical opposition to each other and adapted to engage, respectively, upper and lower mattress portions spaced a substantial distance inwardly from the marginal edge of such mattress, and means operatively connected between the elements for holding the elements in closely vertically spaced apart relation with the mattress gripped therebetween, said elements being of such relative sizes that the lower element is substantially larger than the upper element and is thereby adapted to engage a relatively large area of the bottom of the mattress without material upward deformation of the mattress bottom in that area, the upper element, being materially smaller

than the lower element, engaging a relatively small area of the top of the mattress directly over and generally centered on the bottom area so as to deform said small top area into a depression concentrated at the element-engaged portion of the mattress.

13. The invention defined in claim 12, in which: the lower element has an upwardly facing marginal portion surrounding a recess in said lower element, said marginal portion directly engaging the mattress bottom and said recess accommodating portions of the lower mattress area deflected downwardly incident to formation of the depression created by the upper element.

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