May 17, 1949. F. HAYES 2,470,398

THERAPEUTIC MATTRESS

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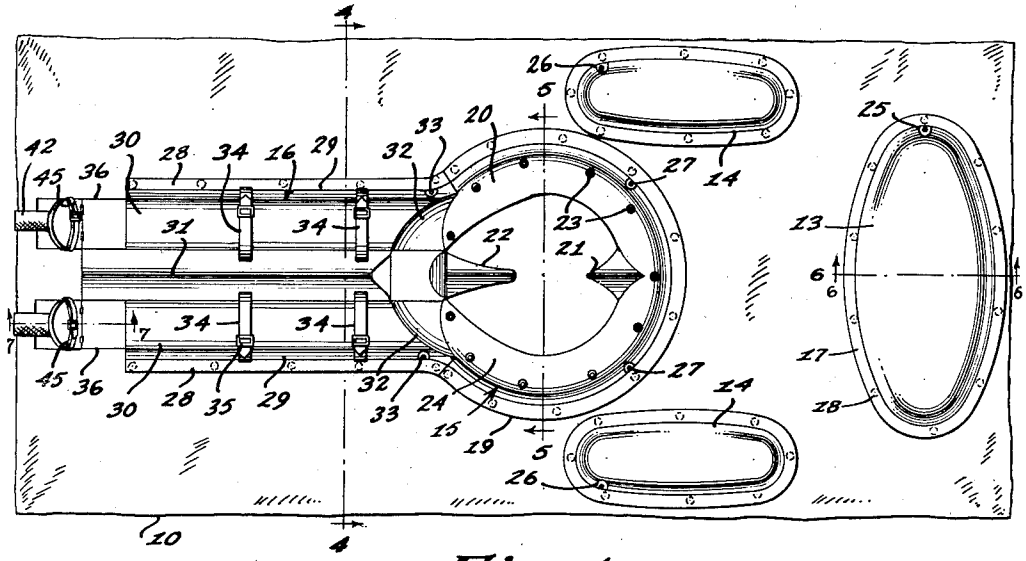


Fig. 1

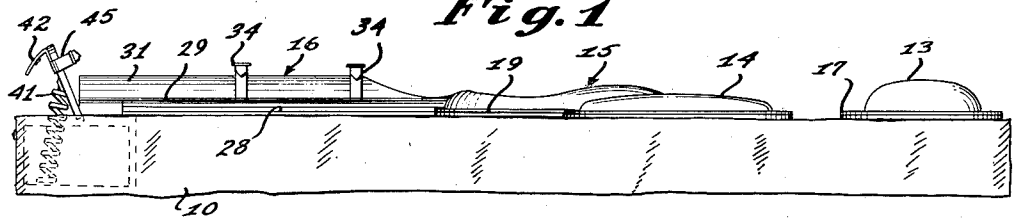


Fig 2

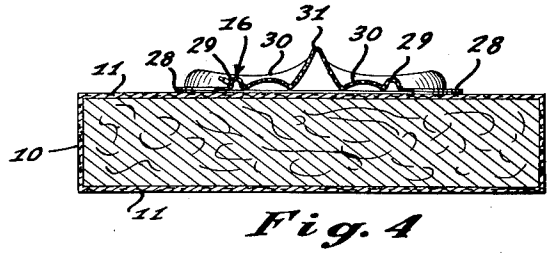


Fig. 4

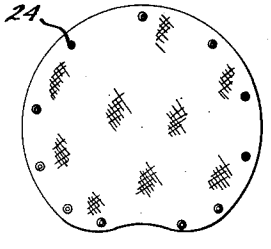


Fig. 8



Fig. 5

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Fig. 3

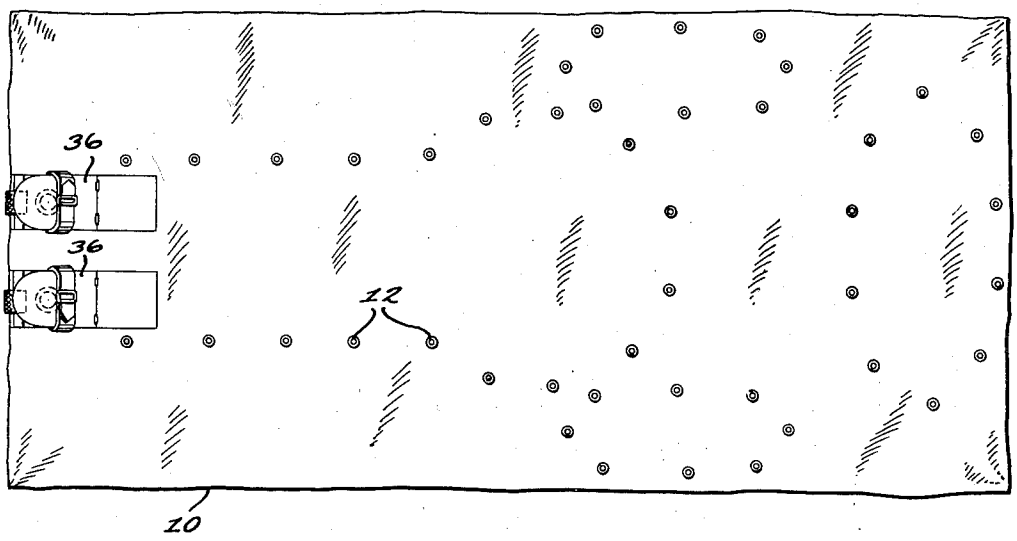


Fig. 6

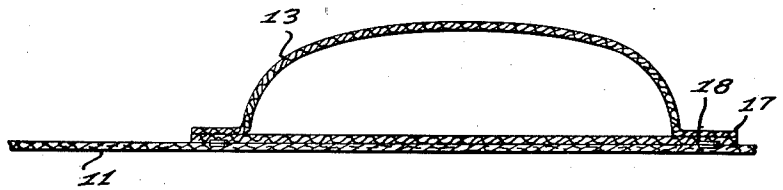
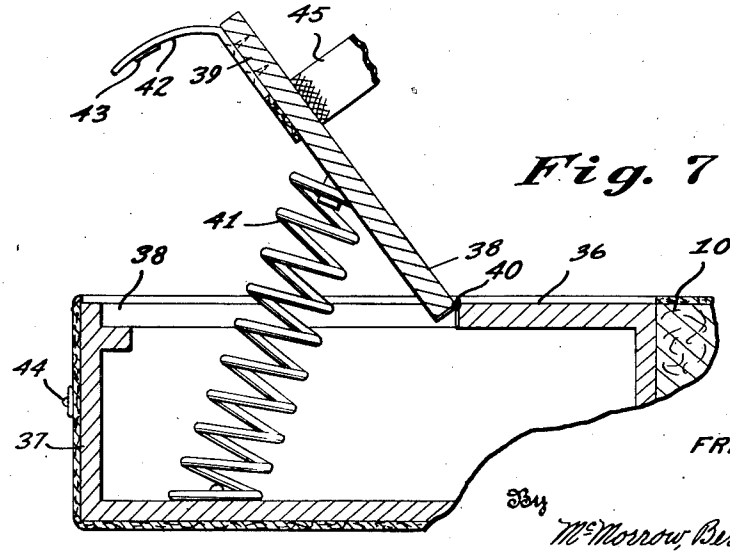


Fig. 7



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Patented May 17, 1949 2,470,398

UNITED STATES PATENT OFFICE

2,470,398

THERAPEUTIC MATTRESS

Frederick Hayes, Los Angeles, Calif.

Application August 1, 1947, Serial No. 765,349

5 Claims. (Cl. 5—91)

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This invention relates to improvements in therapeutic mattresses, and more particularly to a mattress especially arranged for the care of paralytic cases.

It is among the objects of the invention to provide an improved therapeutic mattress having a base portion substantially in the form of a conventional, box-type mattress, but having fastening elements arranged in predetermined patterns on one or both faces thereof for the attachment of specially designed pneumatic rest pads to the base portion of the mattress, and to provide adjustable foot rests on the mattress, wherein the rest pads are arranged to support the head, back, arms, hips and legs of a patient in comfortable position, are inflatable to different degrees of firmness to provide maximum relaxation, and are removable for cleaning, repair and replacement, or when the function of one or more of them is not required, wherein the foot rests resiliently support the patient's feet in comfortable position, are provided with fastening means for securing the feet thereto and are depressable to a position in which they are substantially flush with the surface of the base portion of the mattress, when not in use, and wherein the base portion provides a conventional mattress having a smooth upper surface when all of the pads are removed and the foot rests depressed, which mattress is waterproof and sanitary, fits a conventional hospital bed, is simple in construction, economical to manufacture, and convenient to use, relieves the fatigue of paralytic patients, and greatly facilitates the work of attendants in caring for such patients.

Other objects and advantages will become apparent from a consideration of the following description in conjunction with the accompanying drawings, wherein:

Figure 1 is a top plan view of a therapeutic mattress assembly illustrative of the invention;

Figure 2 is a side elevation of the mattress assembly illustrated in Figure 1;

Figure 3 is a top plan view of the base portion of the mattress assembly with the inflatable rest pads removed therefrom;

Figure 4 is a transverse cross-section on the line 4—4 of Figure 1;

Figure 5 is a transverse cross-section of an inflatable, hip-supporting pad taken substantially on the line 5—5 of Figure 1;

Figure 6 is a transverse cross-section on a somewhat enlarged scale of the head supporting pad or pillow shown inflated and attached to the base portion of the mattress, the section being taken substantially on the line 6—6 of Figure 1;

Figure 7 is a longitudinal cross-section of a foot support taken substantially on the line 7—7 of Figure 1; and

Figure 8 is a detailed plan view of a sanitary

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gauge pad attachable to the hip-supporting pad shown in Figure 5.

Referring to the drawings, the supporting or base portion of the improved or therapeutic mattress comprises a pad or cushion 10 which is preferably of the size and shape of a conventional or standard box-type mattress such as is conventionally used on hospital beds and may, in general, have the same construction as a conventional hospital bed mattress, or other suitable type of mattress, if desired, and may be of either felt, fibre or inner-spring construction. For the sake of simplicity in the description and claims, this box-type mattress portion 10 will hereinafter be referred to as the mattress base or as the base.

The base 10 is provided with upper and lower covers 11 and fastening elements 12, particularly illustrated in Figure 3, are secured into one or both of the covers 11 and arranged in predetermined patterns to detachably engage with cooperative fastening elements secured to inflatable rest pads presently to be described.

The pneumatic or inflatable rest cushions include a head pillow 13 disposed at one end of the base 10 on the upper surface thereof, as illustrated in Figure 1, a pair of arm rest pillows 14, and annular hip-supporting cushion, generally indicated at 15, and a leg-supporting cushion, generally indicated at 16, one end of which is closely associated with the hip-supporting cushion or pad 15.

The head-supporting pad or pillow 13 is shown in section in Figure 6, and comprises two sheets of flexible, impervious material, such as rubberized fabric, secured together around the edges thereof in a manner to provide an outwardly-extending marginal flange 17, in which fastening elements 18 are secured. The fastening elements 12 and 18 are preferably cooperative parts of conventional snap fasteners by means of which the rest pads may be detachably secured to the mattress base 10, so that they may be removed, when desired, for cleaning, repair or when the function of one or more of them is not required. The pillow or pad 13 is inflatable to a thickness up to approximately six inches, and is of substantially the same size and the general shape of a conventional pillow. The arm rest pads 14 are of the same general shape as the head rest pad or pillow 13, but are of less width. These pads 14 are also formed of two sheets of relatively impervious material marginally secured together to provide outwardly-extending flanges in which fastening elements are secured, and which fastening elements cooperate with certain of the fastening elements 12 in the cover of the base 10 to detachably secure the arm rest pads 14 in operative position.

The hip-supporting pad, generally indicated at 15, is an annular pneumatic cushion also

formed of two layers or sheets of relatively impervious material secured together at the inner and outer edges of the annular cushion and provided with an external flange 19 to which fastening elements are secured which also cooperate with certain of the fastening elements 12 to detachably secure this pneumatic pad 15 in operative position. The annular portion 20 of the pad 15 is provided with two oppositely-disposed, pyramidal projections 21 and 22 which extend inwardly of the portion 20 substantially along the longitudinal center-line of the cover of the base 10, and in position to lay between the hips of a patient supported on the mattress. The annular ring-shaped cushion 20 is provided on its upper surface with snap-fastening elements 23 by means of which a sanitary gauze pad 24, particularly illustrated in Figure 8, may be attached to the hip-supporting cushion to overlie the area of this cushion.

The head-supporting cushion 13 is provided with a single air valve 25 and each arm-supporting cushion is provided with a single air valve 26 while the hip-supporting cushion 15 is preferably provided with a pair of air valves 27 located at opposite sides of the cushion for convenience in inflating the cushion or varying the inflation pressure while a patient is in position thereon. In certain applications it may also be found desirable to divide the cushion 15 into two halves separated by internal partitions so that the two halves may be inflated to different pressures to provide the maximum comfort for certain paralytic cases.

The leg-supporting pad 16, shown in transverse cross-section in Figure 4, comprises two sheets of relatively impervious material secured together marginally in a manner to provide external flanges 28 into which fastening elements are secured to cooperate with certain of the fastening elements 12 to detachably secure the leg-supporting pad 16 to the cover of the base 10. The two sheets comprising the upper and lower portions of the pad 16 are also secured together intermediate the width of the pad to provide marginal projections 29, leg-supporting pads 30 lower than the projections 29, and a central projection 31 which extends upwardly between the pad portions 30 to maintain the legs separated and in a substantially straight position. In an operative arrangement the pad portions 30 have a maximum inflation thickness of approximately two inches, the marginal upstanding projections 29 a maximum height of approximately four inches, and the central projection 31 a maximum height of substantially six inches, the projections 29 and 31 preferably having a somewhat triangular, cross-sectional shape in order that they may comfortably conform to the shape of a person's legs. At the end of the pad 16 adjacent the pad 15, the end portions of the portion 30 are so shaped that they will raise under inflation somewhat above the level of the remainder of the leg-supporting portion, as indicated at 32, to provide a smooth, inclined connection between the upper surface of the hip-supporting pad 15 and the upper surfaces of the leg-supporting portions 30 of the pad 16. Each of the portions 32 is preferably connected with the center extension 31 and with the corresponding marginal extension 29 to pneumatically connect the center extension, the leg-supporting pad, and the marginal extension at each side of the pneumatic pad 16. A pair of air valves 33 are provided one at each side of the pad 16

at the ends thereof which fits against the corresponding end of the pad 15 so that the pad 16 can be conveniently inflated from either side and both sides thereof brought to the desired inflation pressure.

Straps 34 provided with respective buckles 35 are secured to the two sides of the pad 16 in position to pass across the leg-supporting portion 30 thereof so that the patient's legs may be held in position on the pad 16, when desired.

A pair of foot supports 36 are provided at the end of the pad 16 remote from the pad 15. One of these foot rests is illustrated, in detail, in Figure 7, and comprises a base or support 37 firmly secured in the foot-end portion of the base. If desired, the support 37 may extend entirely through the mattress base and be secured to both covers and the filling thereof and to the end-wall of the base, each support 37 being provided in its upper surface with a recess 38 of a shape and size to receive a foot-supporting leaf 39 hinged at one end to the support 37 at one end of the corresponding recess by a suitable countersunk hinge 40.

A compression spring 41 secured in the supporting portion 37 bears at its upper end against the under-side of the leaf 39 to resiliently urge the leaf to the foot-supporting position illustrated in Figure 7. A strap 42 is secured at one end to the outer end of the leaf 39 and is provided at its opposite end with a fastening element 43 engageable with a cooperating element 44 secured to the end-wall of the support 37 to releasably hold the leaf 39 in retracted position in the recess 38, when desired.

The leaf 39 of each foot rest is provided with a strap 45 by means of which the patient's feet may be secured to the rest, when desired. The two foot rests are entirely similar in construction and are disposed one at the end of each of the leg-supporting portions 30 of the pad 16 in position to comfortably support the feet of a patient whose legs are positioned on the leg-supporting pad 16.

When the leaves 39 of the foot rest are held in the corresponding recess 38 and the various pneumatic cushions removed from the base 10, the base 10 may function as a conventional mattress having a smooth upper surface since the upper surface of the foot-rest support 37 is flush with the upper cover 11 of the mattress base.

As explained above, all of the pneumatic rest cushions may be used when necessary, or one or more of them may be omitted when its function is not required, and the cushions may be suitably inflated to provide the maximum condition of comfort and relaxation for a patient supported on the mattress.

The improved therapeutic mattress is effective to support a paralytic patient in a manner to greatly alleviate the pain and fatigue of his condition and also greatly facilitate the work of attendants in caring for such a patient by providing rest pads which will remain in place and which may be made hard or soft by varying the inflation thereof as may be found to provide the maximum comfort for the patient.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing de-

scription, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. A therapeutic mattress comprising a mattress base having a shape corresponding to that of a conventional box mattress, a plurality of flush-type fastening elements secured to the covering over one face of said base and arranged in predetermined patterns, a plurality of inflatable pads having respective marginal flanges, and a plurality of fastening elements secured in each of said flanges and engageable with fastening elements secured in the cover of said base to detachably secure said pads to said base in predetermined positions thereon, a pair of hollow-supports secured in said mattress base near one end of the latter and a pair of foot rests secured respectively to said supports, depressible to a position in which they are substantially flush with the upper surface of said base, and spring means in said supports resiliently urging said foot rests to a raised, foot-supporting position.

2. A therapeutic mattress comprising a base having a shape corresponding to that of a conventional box-type mattress, a plurality of flush-type fastening elements secured to the covering over one face of said base and arranged in predetermined patterns, a plurality of inflatable pads having respective marginal flanges, and a plurality of fastening elements secured in each of said flanges and engageable with fastening elements secured in the cover of said base to detachably secure said pads to said base portion in predetermined positions thereon, said pads comprising a full-size pillow for the patient's head, smaller pillows constituting arm-rest pads, a hip-supporting pad, a leg-supporting pad, said hip-supporting pad comprising an annular pneumatic pad having a transversely convex upper portion and two oppositely-disposed pyramidal extensions projecting inwardly thereof in position to lie between the hips of a patient.

3. A therapeutic mattress comprising a base portion having a shape corresponding to that of a conventional box-type mattress, a plurality of flush-type fastening elements secured to the covering over one face of said base portion and arranged in predetermined patterns, a plurality of inflatable pads having respective marginal flanges, and a plurality of fastening elements secured in each of said flanges and engageable with fastening elements secured in the cover of said base portion to detachably secure said pads to said base portion in predetermined positions thereon, said pads comprising a full-size pillow for the patient's head, smaller pillows constituting arm-rest pads, a hip-supporting pad, and a leg-supporting pad, said hip-supporting pad comprising an annular pneumatic cushion having a transversely convex upper portion provided with fastening elements for the attachment of a gauze pad thereto, an external flange around the lower portion thereof carrying fastening elements for the attachment of said pad to said base portion, and two oppositely-disposed, pyramidal extensions projecting inwardly thereof in position to lie between the hips of a patient supported on said pad.

4. A therapeutic mattress comprising a base portion having a shape corresponding to that of a conventional box-type mattress, a plurality of flush-type fastening elements secured to the covering over one face of said base portion and arranged in predetermined patterns, a plurality of

inflatable pads having respective marginal flanges, and a plurality of fastening elements secured in each of said flanges and engageable with fastening elements secured in the cover of said base portion to detachably secure said pads to said base portion in predetermined positions thereon, said pads comprising a full-size pillow for the patient's head, smaller pillows constituting arm-rest pads, a hip-supporting pad, and a leg-supporting pad, said leg-supporting pad comprising a longitudinal central ridge, inflated leg-supporting portions having an inflated height materially less than the inflated height of said central ridge extending one along each side of said central ridge, marginal ridges having an inflated height greater than that of said leg-supporting portions but less than that of said central ridge, disposed one along the outer edge of each leg-supporting portion, corresponding end portions of said leg-supporting portions having a thickness greater than the remainder of said leg-supporting portion and pneumatically connected with said central ridge and the corresponding marginal ridges, and flanges extending outwardly from the outer of said marginal ridges carrying fastening elements for securing said pad to said base portion of said mattress.

5. A therapeutic mattress comprising a base having a shape corresponding to that of a conventional box mattress, a plurality of flush-type fastening elements secured to the covering over one face of said base and arranged in predetermined patterns, a plurality of inflatable pads having respective marginal flanges, and a plurality of fastening elements secured in each of said flanges and engageable with fastening elements secured in the cover of said base to detachably secure said pads to said base in predetermined positions thereon, and a pair of foot rests secured to said base depressible to a position in which they are substantially flush with the upper surface of said base and resiliently urged to a raised, foot-supporting position, said foot rests each comprising a supporting portion secured in said mattress base and having recesses in the upper surface thereof, a foot-supporting leaf secured to said supporting portion and receivable in said recess, a spring operatively disposed between said supporting portion and said leaf to resiliently urge said leaf out of said recess and into foot-supporting position, and means attached to said leaf and detachably connectible with said supporting portion to secure said leaf in said recess against the force of said spring.

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