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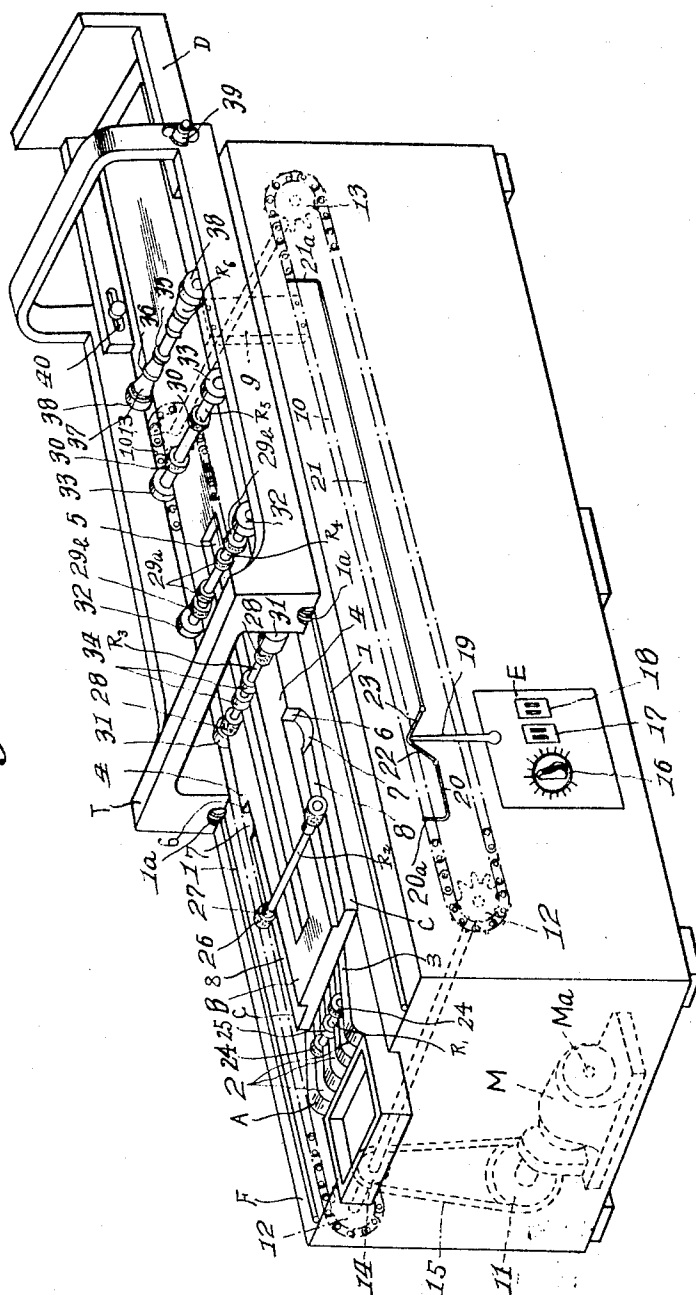
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3,446,205

BED WITH MASSAGING ROLLERS

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Sheet 2 of 2

$$F = g^3.$$


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BED WITH MASSAGING ROLLERS

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2 Claims

ABSTRACT OF THE DISCLOSURE

A bed for medical treatment has a first frame. A pair of rails are provided on the frame and movably support a second frame. A head support is provided on the first frame, as well as a back support and a scapula support. Roller elements mount the supports for rolling increment along the first frame and also effect rolling massage of the body of a person supported on these supports within the confines of the second frame when the latter, and thereby the person and the supports on which the person rests, are reciprocated relative to the first frame.

This invention relates to improvements in a bed for human medical treatment.

Heretofore, various medical instruments have been proposed for the treatment and the cure of the human spine with certain effects. But all of them have been applied in such a manner as to push or rub manually an affected part of a patient with the instrument held by an operator. Alternatively the patient is made to lie down on his face or his back, and then a roller or the like is pushed or rubbed over his body. Therefore, the effect of the treatment for affected parts has principally depended upon the experience and skill of the operator with no emphasis on the problem of holding the patient in a more comfortable state and providing greater efficiency of treatment.

One object of this invention is to overcome the above drawbacks and to provide a bed for the medical treatment or cure of certain ailments which is more comfortable for both the operator and the patient and also provides for improved treatment or cure.

Another object of this invention is to provide a bed of the class described, which is adapted to individually apply rollers of various sizes to a number of affected parts of a patient and to treat simultaneously these parts so as to speed up the operation.

Still another object of the invention is to provide a bed of the class described, which is of simple construction, may be inexpensively produced and may be easily operated for a very considerable length of time without requiring any specified attention.

Briefly stated in accordance with one aspect of this invention, there is provided a bed for medical treatments. The bed comprises a frame provided with a pair of rails, a movable frame movably supported by said rails, a head support arranged on the front central part of the first-named frame, the head support being provided with a number of longitudinal grooves arranged in parallel with each other, a back support arranged on the first-named frame and close to the rear of the head support, the back support being provided with a central groove extending longitudinally along about half of its length starting from the front end thereof, a pair of scapula supports arranged in contact with a pair of cut parts of the back support and provided in the both front sides thereof, each scapula support being provided with a sidelong inclined path and a rear recess in its top surface, the sidelong inclined paths being arranged in the same plane with the upper

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surface of the back support and above the top of the first-named frame, the head support, the back support, and the scapula supports having top surfaces inclined downwards and rearwards, respectively, and a plurality of roller elements, one of them being arranged in engagement with the longitudinal grooves of the head support, another of them being arranged in engagement with the central groove of the back support, still another of them being arranged in engagement with the top surfaces of the scapula support, and other of them being arranged in engagement with the top surface of the back support, and the roller elements being adapted to be rollable while being kept in such engagement.

The movable frame in which a patient is kept lying on the back is made to reciprocate on the frame automatically so as to push or rub his body with the roller elements, whereby a medical treatment or cure is effectively obtained.

The invention will be better understood and other objects and additional advantages of the invention will become apparent upon perusal of the following description taken in connection with the drawings, in which:

FIG. 1 is a plan view of a bed embodying this invention;

FIG. 2 is a right side elevational view thereof; and
FIG. 3 is a perspective view thereof.

Referring more particularly to the drawings, the preferred embodiment of this invention will now be described; however, this description should be understood to be illustrative of the invention and not as limiting it to the particular construction shown and described. A rectangular frame F is fixed on a floor G. A pair of rails 1 is provided along the longitudinal side of the upper surface of the frame F. A head support A is fixed on the frame F, being arranged on the central part near the front end of the frame F (the leftmost end in the drawings) and provided with downwardly and rearwardly inclined surface 3. Three longitudinal grooves 2 are formed in the central part of the inclined surface 3. A back support B having an inclined surface 4 is arranged in the rear of the head support A. The front end of the back support B is lapped somewhat over the rear end of the head support A and the rear end of the back support B is extended almost to the rear end of the frame F. The inclined surface 4 of the back support B is also inclined down and rearwards. The back support B is provided with a central groove 5 extending longitudinally along about half of its length starting from the front end thereof.

The back support B is broader than the head support A but the frontmost part of the former is narrower than as the latter, forming cut parts 6 on both sides of the back support B. A pair of scapula supports C are arranged in each of the cut parts 6. The upper surfaces of the scapula supports C are formed with a pair of sidelong inclined paths 8 inclined down and rearwards and with a pair of rear recesses 7. The sidelong inclined paths 8 are arranged in the same plane with the inclined surface 4 of the back support B but the sidelong inclined paths 8 are lower than the inclined surface 4 of the back support B.

A rectangular movable frame T into which a patient is to be placed is bottomless and provided with pairs of rollers adapted to engage with the rails 1 of the frame F, so that the movable frame T may be moved longitudinally on the frame F. An adjusting member D is adjustably attached to the rear end of the movable frame T, in such a manner that a laterally extending bolt is inserted through a longitudinal slit 40 and secured by a wing nut 39 on each lateral side.

An electric motor M is provided on a base on the floor G inside the front part of the frame F. A laterally extend-

ing driven shaft is journaled by the frame F and arranged above the motor M. The driven shaft is driven by means of a belt 15 which is driven by a drive wheel 11 fixedly mounted on the drive shaft of the motor M and which belt drives a driven wheel 14 fixedly mounted on the driven shaft. A pair of front sprocket wheels 12 are fixedly mounted on the lateral ends of the driven shaft. Another pair of rear sprocket wheels 13 similar to the sprocket wheels 12 are rotatably mounted on a laterally arranged shaft at the rear end of the frame F. An endless chain 10 is placed about the right-hand one of the sprocket wheels 12 and the right-hand one of the sprocket wheels 13, and another similar endless chain 10 is placed about the left-hand ones of the sprocket wheels 12 and 13. A pair of connecting members 9 are arranged laterally on the bottom surface of the movable frame T at a point a little rearward from the longitudinal center thereof and secured thereto. Both lateral ends of the connecting members 9 are connected with the endless chains 10, respectively. By such means, it is possible to move the movable frame T longitudinally along the rails 1.

There is an electric controlling means E arranged in a suitable place as on the right side of the frame F, which includes a time switch 16, a starting switch 17 and a power switch 18. Further a swingable rod 19 is provided in such a manner as to swing to and fro as a pointer and to change the input of the motor M so as to reverse the rotation of the motor M. There is a longitudinally slidable rod comprising an upturned front end 20a, a front half rod 20, a rear half rod 21, and an upturned rear end 21a. Between the front half rod 20 and the rear half rod 21 is interposed an upward angle piece comprising a front half piece 22 and a rear half piece 23. The upward angle piece is adapted to engage with the top of the swingable rod 19. The upturned front end 20a and the upturned rear end 21a are adapted to engage with the one of the connecting members 9. By means of such an arrangement as above, when the connecting member 9 is brought into engagement with either of the upturned ends 20a or 21a, the swingable rod 19 is made to swing as the pointer so as to reverse the rotation of the motor M and the sliding direction of the movable frame T thereby.

There are a number of freely rotatable and rollable rollers in the head support A and the back support B. A roller 25 made of hard wood is longitudinally freely rotatably and rollably mounted in the central longitudinal groove 2 and a roller 24 having a rubber-covered circumferential surface and a larger diameter than the roller 25 is longitudinally freely rotatably and rollably mounted in each of the two side grooves 2. These three rollers 25 and 24 may be integrated one after another into a roller element R1 having three circumferential surfaces protruded beyond the top surface of the head support A. A roller element R2 comprises a shaft, two large wheels 26, and two small wheels 27. The two large wheels 26 having rubber-covered circumferential surfaces are fixedly mounted on the extremities of the shaft and adapted to be longitudinally freely rotatable and rollable on the top surface of the scapula supports C, respectively. The two small wheels 27 made of hard wood are placed co-axially with and just inside the two large wheels 26 and adapted to roll along the both longitudinal sides of the cut parts 6 of the back support B, respectively. A roller element R3 comprises a shaft, two central small wheels 34 made of hard wood and two large wheels 28 having rubber-covered circumferential surfaces. The two central small wheels 34 are adapted to roll along both sides of the central groove 5 of the back support B. The two large wheels 28 have outside flanges 31 made of hard wood which are adapted to roll along the both longitudinal sides of the back support B. A roller element R4 comprises a shaft, two small wheels 29a, two large wheels 29b, and two outside wheels 32. The two small wheels 29a arranged inside and the two large wheels 29b arranged outside are mounted on the shaft, and they are provided with rubber-covered circum-

ferential surfaces. The two outside wheels 32 are mounted on the extremities of the shaft and adapted to roll along the both longitudinal sides of the back support B. A roller element R5 comprises a shaft, two intermediate wheels 30, and two outside wheels 33. The two intermediate wheels 30 have rubber-covered circumferential surfaces. The two outside wheels 33 are mounted on the extremities of the shaft and adapted to roll along the both longitudinal sides of the back support B. A roller element R6 comprises a middle frusto-conical slender shaft, two intermediate wheels 35, two inside wheels 36, two outside wheels 37 and two outside flanges 38. The two intermediate wheels 35, the two inside wheels 36 and the two outside flanges 38 are made of hard wood. The two outside wheels 37 have rubber-covered circumferential surfaces. The diameter of the outside wheel 37 is larger than the largest diameter of the inside wheel 36 and the diameter of the flange 38 is larger than the diameter of the outside wheel 37. The flanges 38 are adapted to roll along the both longitudinal sides of the back support B. The roller elements R3, R4, R5 and R6 are removably placed on the back support B in suitable positions which will be dictated by the nature of the illness which is to be treated, and are rollable by virtue of the rubber cover provided around the circumferences of the wheels 28, 29a, 29b, 30 and 37, so as to be prevented from a skid-like lost motion. When wheels 26 and 27 are placed on the rear recesses 7 of the scapula supports C, they are left to be rotated at that point without rolling. The roller elements R1, R2, R3, R4, R5 and R6 are adapted to be employed for engaging with the nape, scapulae, back, waist, pelvis and coccyx, and legs of the patient, respectively.

In operation, a patient is made to lie down on his back inside the movable frame T longitudinally with his head ahead. His legs are fixed in the movable frame T by adjusting member D so as to make the inner size of the movable frame T coincide with the stature of the patient. His body is then bound with the movable frame T by a binding means. Next, the power switch 18 and the time switch 16 are closed.

For starting a medical operation, the starting switch 17 is closed first. By closing the starting switch 17, the motor M is energized and drives the sprocket 12 so as to drive the endless chains 10. The movable frame T connected with the endless chains 10 by means of the connecting members 9 is made to move longitudinally, carrying the patient therein. Thus, in whichever direction the movable frame T is displaced, the patient is moved with his back on the corresponding rolling rollers so as to push, rub, and massage his back surely, promptly, and easily for a medical treatment or cure. Other parts of the body than the scapulae of the patient are prevented from any unexpected and disadvantageous engagement with the roller element R2 by virtue of the provision of the recesses 7. By virtue of the provision of the central groove 5 extended on the top surface of the back support B longitudinally from the proximity of the front end to nearly the center thereof, any medical treatment or cure for the spine is very facilitated. It is possible to adjust the arrangement of the roller elements longitudinally in accordance with any requirement depending upon the physique and the distribution of the affected parts, so that it is possible to treat the nape, scapulae, back, legs, and other parts of the patient simultaneously. By virtue of the provision of the movable frame T, it is possible to maintain the patient in easy circumstances during the treatment. By virtue of the rearward and downward inclination of the top surfaces of the head support A, back support B and the scapula support C, the patient will be comfortable when lying down.

When the connecting member 9 of the movable frame T is brought into contact with either the upturned front end 20a or 21a of the slidable rod depending upon the direction of the motion of the movable frame T, the direction is reversed in the following manner: At first the connecting member 9 pushes either the upturned end 20a

or 21a a little longitudinally so that the upward angle 22 and 23 is displaced a little longitudinally so as to swing the swingable rod 19. The swinging motion of the swingable rod 19 changes over the input for the motor M so as to reverse the rotation of the motor M and then the motion of the endless chains 10 is made reverse. When the endless chains 10 are made to move in reverse, the connecting rod 9 carrying the movable frame T is made to start the counter travel, leaving the upturned end 20a or 21a as it is. Thus the movable frame T carrying the patient repeats the reciprocation automatically. The treatment may be effected during either stroke of the reciprocation of the movable frame T so that speedy effective treatment or cure may be expected.

While a particular embodiment of the invention has been illustrated and described, modifications thereof will readily occur to those skilled in the art. It should be understood therefore that the invention is not limited to the particular arrangement disclosed but that the appended claims are intended to cover all modifications which do not depart from the true spirit and scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. A bed for medical treatments, comprising a frame provided with a pair of rails, a movable frame movably supported by said rails, a head support arranged on the front central part of the first-named frame, said head support being provided with a number of longitudinal grooves arranged in parallel with each other, a back support arranged on the first-named frame and close to the rearward of said head support, said back support being provided with a central groove extending longitudinally along about a half of its length starting from the front end thereof, a pair of scapula supports arranged in contact with a pair of cut parts of said back support provided in the front sides thereof, each scapula support being provided with a rear recess, said head support, back support, and scapula

supports having respective inclined surfaces and a pair of sidelong inclined paths inclined down and rearwards, respectively, with the sidelong inclined paths of said scapula supports being arranged in the same place as the inclined surface of said back support and above the top of the first-mentioned frame, and further comprising a plurality of roller elements, one of them being arranged in engagement with said longitudinal grooves of said head support, another of them being arranged in engagement with said central groove of said back support, still another of them being arranged in engagement with the pair of sidelong inclined paths of said scapula supports, and others of them being arranged in engagement with the inclined surface of said back support, and said roller elements being adapted to be rollable while being kept in said engagement.

2. A bed for the medical treatment, as claimed in claim 1, in which said movable frame is adapted to hold a patient lying down therewithin and provided with a connecting member connected with a pair of endless chains, said each endless chain being hung over a pair of sprockets which are driven by an electric motor, said motor being reversed by a swingable rod so as to reciprocate said movable frame, said swingable rod being made to swing in accordance with reciprocation of a slidable rod having upturned ends, and said upturned ends being adapted to be pushed by said connecting member when the latter finishes a stroke of the first-named reciprocation, whereby said movable frame is reciprocated repeatedly.

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