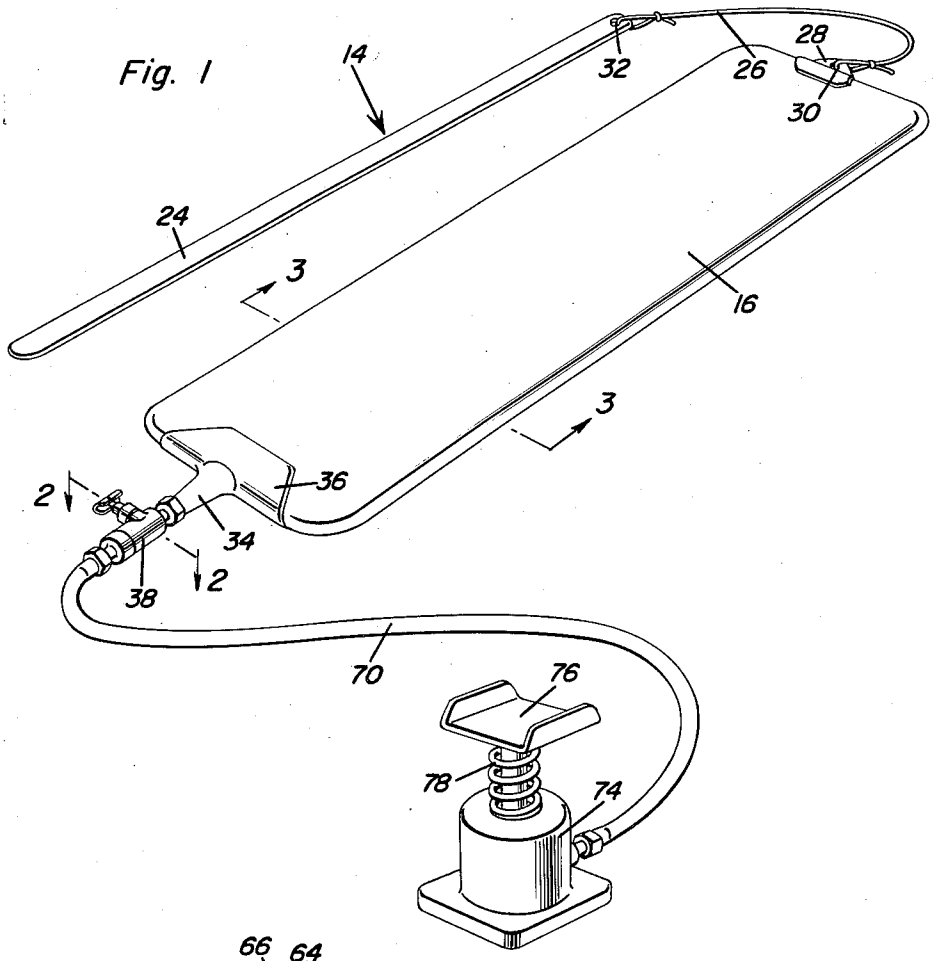
March 27, 1962 A. R. MURAT 3,026,541

PNEUMATIC LIFTER FOR BED PATIENT

Filed Oct. 27, 1959 2 Sheets-Sheet 1

Fig. 1



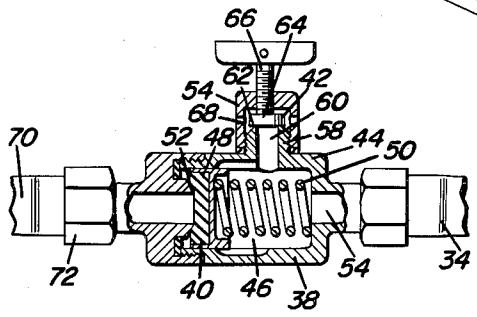
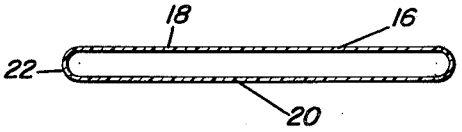


Fig. 2

Fig. 3



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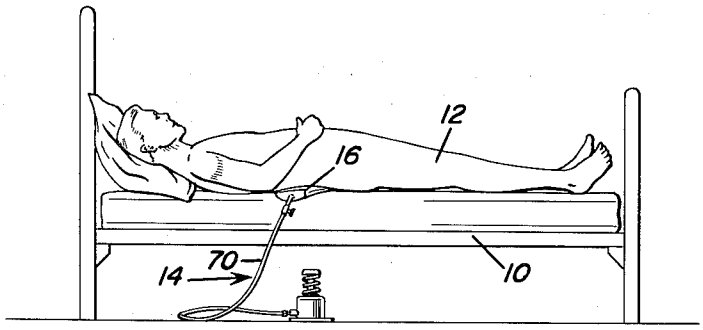

Fig. 4

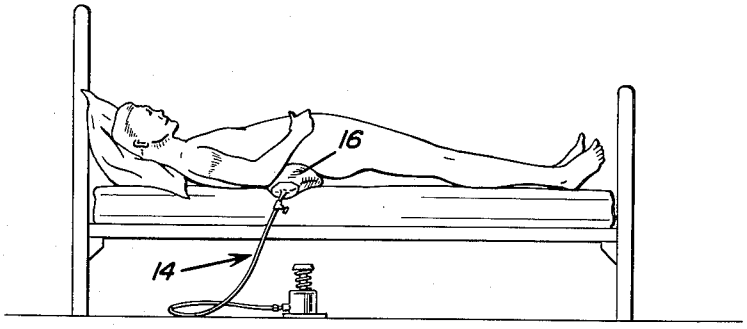

Fig. 5

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United States Patent Office 3,026,541
Patented Mar. 27, 1962

3,026,541

PNEUMATIC LIFTER FOR BED PATIENT

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Filed Oct. 27, 1959, Ser. No. 848,955
6 Claims. (Cl. 5—81)

This invention relates to lifts, and more particularly to a special purpose lift.

An object of the invention is to provide a pneumatic lift for a bed patient to facilitate elevating the torso portion of the patient, this being particularly difficult when involving even a medium size person.

More explicitly, it is very difficult to lift a bed patient for the purpose of inserting or removing a bedpan. One person must stand to one side of the bed to perform this task and several unsatisfactory techniques are used. The invention materially facilitates this task by relying on pneumatic pressure to inflate a plastic bag or bladder which is first located beneath the bed patient. When elevated by the pneumatic pressure, the pan may be easily inserted, after which the patient may be gently lowered. Thereafter the patient may again be lifted by the application of additional pressure and the pan removed. Finally, the patient may be lowered gently and the inflatable pad removed.

Accordingly, it is a further object of the invention to provide an appliance which may be used in the home, hospital, nursing home, etc. for materially facilitating the lifting and lowering of a patient especially when only a portion of the patient's body has to be elevated.

One of the important features of the invention is that it provides a means for elevating a portion of a patient's body whereby a pneumatic elevating pad is easily inserted and removed. Further, the application of air under pressure into the pneumatic pad is effected by a foot operation thereby leaving both hands of the user free.

These, together with other objects and advantages which will become subsequently apparent, reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a perspective view of an assembly constructed to exemplify the principles of the invention.

FIGURE 2 is an enlarged sectional view of a valve and taken on the line 2—2 of FIGURE 1.

FIGURE 3 is a sectional view taken on the line 3—3 of FIGURE 1.

FIGURE 4 is a side elevational view of the pneumatic lifter in place prior to inflation of the pad to elevate the patient.

FIGURE 5 is a side elevational view showing the pad in an inflated condition beneath the patient.

In the accompanying drawings, there is illustrated a conventional bed **10** occupied by patient **12**. FIGURE 4 shows the patient with the lifter **14** placed between the small of the back of a patient and the mattress of the bed. FIGURE 5 shows the same lifter **14** in one stage of operation.

Lifter **14** (FIGURES 1–3) is made of an inflatable bag in the shape of a pad **16**. It has upper and lower walls **18** and **20**, respectively, together with edge walls **22** joined to the upper and lower walls to form an essentially rectangular, flat, inflatable pad. Although vinyl plastic may be used as one substance for the pad **16**, it is to be clearly understood that other equivalent, elastomeric substances, such as rubber, may be employed.

There is an elongate flat rod **24** attached by means of flexible cord **26** to one end of pad **16**. A reinforced cord attaching patch **28** is secured to one end of pad **16** and

has an opening **30** in it by which to fasten one end of the cord to the pad. Rod **24** has an opening **32** at one end thereof to which the same cord **26** is secured whereby the flat rod **24** is mechanically connected to the pad at one end thereof.

An inflation fitting, for example, neck **34**, is secured to the opposite end of the pad. Reinforcing **36** is at the juncture of neck **34** with the end of pad **16**. Valve **38** is connected to neck **34**. The valve **38**, see FIGURE 2, is actually a double valve in that it includes a check valve part **40** and an air relief valve part **42**. A single valve body **44** can be used, in which case the valve body has valve chamber **46** in which a piston type valve element **48** is disposed. The valve element is pressed by means of spring **50** against air inlet port **52** at one end of the valve body **38**. The other end of the valve body has an air discharge port **53** in registry with the bore (not shown) of neck **34**. Accordingly, the check valve part **40** is normally closed and contains the pneumatic pressure in the pad **16**.

The valve part **42** is made of a case **54** which is threaded or otherwise secured to a nipple **58** whose bore **60** is in registry with the valve chamber **46**. Port **62** at the end of nipple **58** is closed by valve element **64** attached to one end of threaded valve spindle **66** which is carried by case **54**. Exhaust ports **68** are in the side wall of case **54** so that when the valve element **64** is separated from port **62** there is a vent passageway established between ports **68**, bore **60**, valve chamber **45**, port **54**, the passage or bore of neck **34**, and the interior of pad **16**.

Pneumatic pressure line **70** is connected by means of coupling **72** to the inlet port portion of the valve body **38**. Foot operated pump **74** of conventional design is connected with pressure line **70**. The foot operated pump has a footrest **76** and a return spring **78** among the other parts of the pump structure (not shown). Upon application of pressure to footrest **76**, the piston of the pump **74** is pushed inwardly of the pump cylinder and applies air under pressure through pressure line **70** to the interior of pad **16**, opening check valve part **52** as the air under pressure travels from the pump to the interior of pad **16**. Valve part **52** can be made to function as the foot valve of the pump **74** or the pump may be designed with its own foot valve in addition to valve part **52** or in lieu of valve part **52**. In the latter case, an additional conventional two-way valve will be connected in the pressure line **70** in order to lower the patient gently.

In use, the rod **34** is pushed under the patient to facilitate placement of the pad **16** beneath the patient as shown in FIGURES 4 and 5. The rod **24** is simply pushed under the patient and reached at the other side of the patient. Then it is pulled thereby pulling the cord **26** and pad **16** beneath the patient.

Thereafter, air under pressure is applied to the interior of the pad by operation of pump **74**. When the patient is elevated sufficiently, a bedpan may be inserted between the patient and the mattress. Then upon opening valve part **42**, the patient may be gently lowered on the bedpan. The final steps in the suggested procedure are to again elevate the patient; remove the bedpan; and again relieve the pressure in pad **16** and enable the patient to be gently lowered.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A pneumatic lifter for a bed patient, said pneumatic

lifter comprising a source of air under pressure, a flexible elongated pad having a single air chamber therein, means connected said air chamber with said source of air under pressure, and means connected with one end of said pad to facilitate insertion of the pad transversely beneath the patient, said insertion facilitating means including an elongate rigid rod, and means connecting said elongate rod to said pad including a flexible elongate member secured respectively to said rod and to one end of said pad.

2. The combination of claim 1 wherein said source of pressure comprises a foot operated pump, said means connecting said source of pressure with said pad including an air line, and a manually controlled valve in said air line registering with the interior of said pad for release of pressure from the pad in response to adjustment of said valve.

3. In a pneumatic lifter for bed patients, a flexible inflatable pad having an air chamber therein, foot operated means connected with said pad and in registry with said chamber for applying air under pressure into said pad chamber to thereby inflate said pad, and an elongated rigid means flexibly connected with said pad for drawing the pad transversely beneath the patient.

4. An apparatus for raising a portion of a patient's body above the mattress on a bed and to facilitate applying and removing a bedpan comprising: an elongated inflatable pad of a length and cross-sectional dimension that it may be placed, when in a deflated condition, under the small of the patient's back, said pad when intentionally and properly inflated serving to raise the intended portion of the patient's body to assume a predetermined elevation position, a bedside source of air pressure comprising a portable foot-operated pump of a size and capacity capable of generating the prerequisite amount of air pressure needed to inflate the pad, said pump having a foot-operated plunger, a hose of prerequisite length and cross-section having one end connected to said pump, said hose having regulatable valve means therein, said valve means connected with the inflation chamber of said pad, a pad piloting, inserting and drawing member, said member being of a length to be interposed between the body of the patient and mattress of the bed and permitting an end portion to be grasped by either the patient or the attendant, and means flexibly connecting one end of said member with a leading end of said pad.

5. The structure defined in claim 4 and wherein the aforementioned valve means is arranged in close proximity to and connected wth the trailing end of said pad, said valve means embodying a casing having a spring-loaded pressure responsive check valve and also embodying a communicable and associated manually openable and closeable air bleeding valve which permits the pad to be deflated at will.

6. A portable bedside pneumatic-type apparatus through the medium of which a prescribed portion of the body of a bedridden patient may be temporarily elevated to facilitate inserting a bedpan between the mattress and the patient comprising: an inflatable and deflatable bag constituting a pad and of a length and width to be conveniently interposed between the mattress and small of the back of a supine patient, said pad having leading and trailing ends, said leading end having reinforcing means, a rigid relatively long and narrow piloting flat-faced rod adapted to be passed between the bed mattress and patient as an initial step in using the apparatus, a leading end thereof being free to be caught hold of by either the nurse of the patient, a flexible element connected to the bar, the other end thereof connected to the median portion of the leading end of the pad, the trailing end of said pad having an air introducing nipple, valve means connected operatively and communicatively with said nipple, said valve means embodying a unitary device having a spring-loaded check valve and provided with an air bleeding ported valve means for bleeding air at will, a flexible hose connected at one end with the valve, and a foot-operated air pump connected with said hose, said pump having a spring-returned footrest and operator.

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