

[54] PULMONARY ACHIEVEMENT TRAINER

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[51] **Int. Cl.**..... **A61b 5/08**
[58] **Field of Search**..... 128/2.08, 25; 272/57 F;
73/4.239, 419

[56] **References Cited**

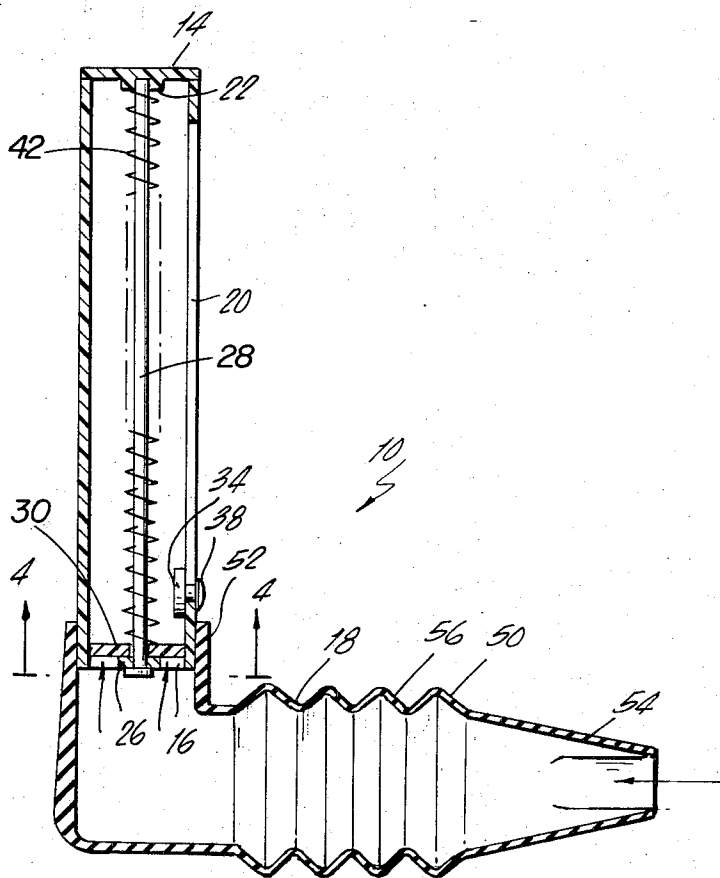
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ABSTRACT

A pulmonary achievement trainer for registering the strongest breath attained by a patient during a predetermined test or therapy period. The pulmonary achievement trainer employs a tube having a special L-shaped mouthpiece and further having an air inlet and a spring pressed plate actuated by air passing into the tube. An indicator is attached to the plate and positioned outwardly of the tube for cooperating with indicia on the tube for providing a direct readout of the actual strongest breath attained by the patient.

1 Claim, 4 Drawing Figures



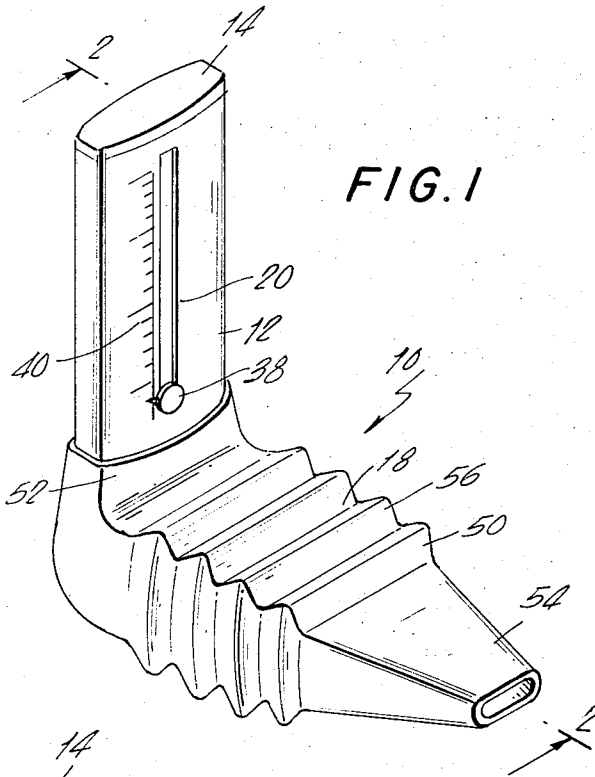


FIG. 1

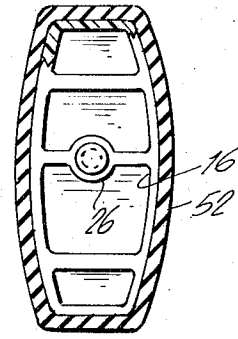


FIG. 4

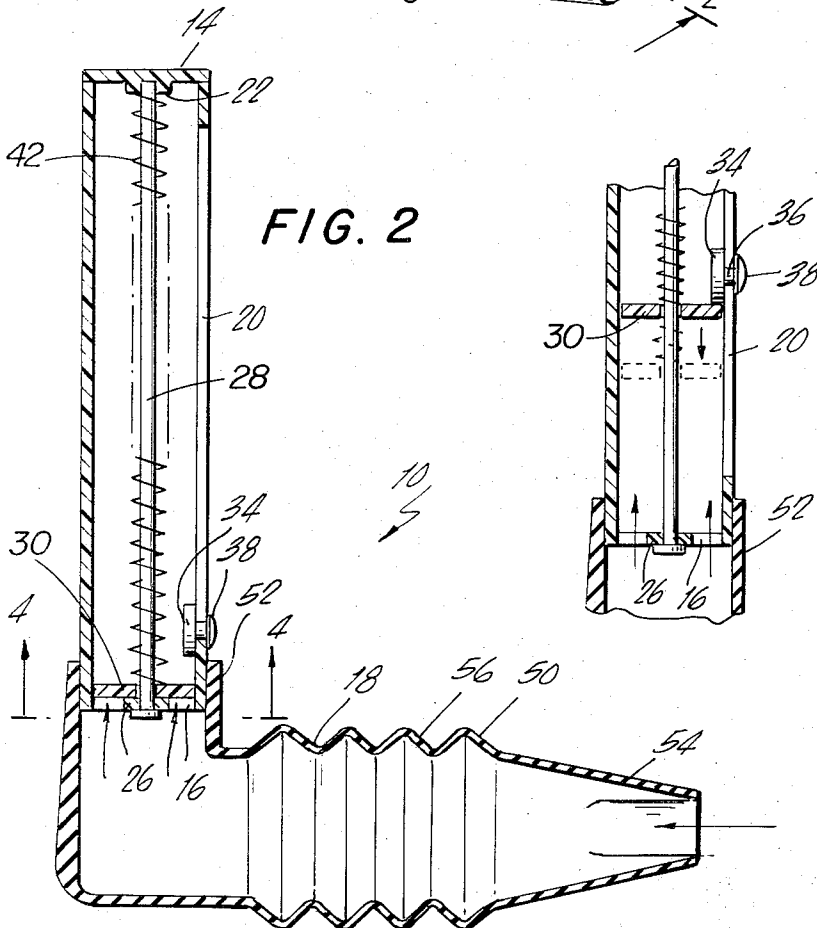


FIG. 2

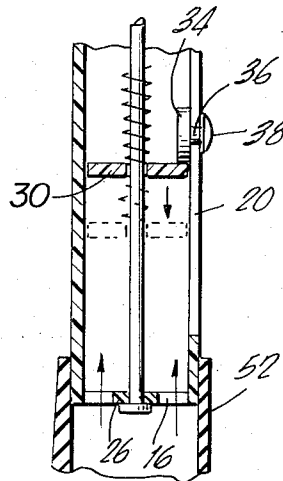


FIG. 3

PULMONARY ACHIEVEMENT TRAINER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the class of diagnostic medical and surgical appliances and more particularly to a pulmonary achievement trainer for testing and providing therapy to a patient having a pulmonary disease.

2. Description of the Prior Art

Various pulmonary diseases such as emphysema or tuberculosis require careful analysis of the condition of a patient's lungs. By requiring the patient to blow into a therapeutic device the condition of the patients lungs can be improved. However, in the past there has been no simple, light weight direction reading pulmonary achievement trainer which will inform the physician of the condition of a patients lungs during therapy sessions.

SUMMARY OF THE INVENTION

The present invention provides an inexpensive light weight sanitary device which may be readily used by a patient during therapy sessions yet which will provide for a direct read-out of the condition of a patient's lungs. The pulmonary achievement trainer is so arranged that it will indicate and maintain an indication, until reset, of the strongest breath which had been attained during a predetermined period of therapy.

The construction of this invention features the use of a tube having an L-shaped mouth piece. A plate is mounted in the tube. Indicator means are provided for visually indicating the movement of the plate when actuated by air passing into the tube due to the patient's breath. These indicator means include a pin engaged by the plate and extending through a slot in the tube.

In the preferred embodiment of the invention the pulmonary achievement trainer is in the form of a vertically arranged tube having an L-shaped mouth piece and a longitudinally extending slot in the tube.

Still further objects and features of the present invention reside in the provision of a breath actuated pulmonary achievement trainer which is simple in construction capable of being manufactured out of readily available materials including synthetic plastics and the like, and which is inexpensive to manufacture, thereby permitting wide use and distribution.

These, together with the various ancillary objects and features of the present invention, which will become apparent as the following description proceeds, are attained by this pulmonary achievement trainer, a preferred embodiment of which is illustrated in the accompanying drawing, by way of example only, wherein:

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view of the pulmonary achievement trainer constructed in accordance with the concepts of the present invention;

FIG. 2 is an enlarged vertical sectional view taken along the plane of line 2—2 in FIG. 1;

FIG. 3 is a partial enlarged detail view illustrating the manner in which the plate and indicator cooperate for indicating the strongest breath attained; and,

FIG. 4 is an enlarged horizontal sectional view illustrating details of construction of the embodiment of the invention and taken along the plane of line 4—4 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With continuing reference to the accompanying drawing, wherein like reference numerals designate similar parts throughout the various views, reference numeral 10 generally designates a pulmonary achievement trainer constructed in accordance with the concepts of the present invention. The pulmonary achievement trainer includes a vertically disposed tube 12 molded out of any suitable synthetic plastic material, such as polystyrene, polyvinyl chloride, or the like, and which may have a closed end 14 and an open end 16 having a mouthpiece of substantially an L-configuration 18 forming an air intake opening into which air may be forced by a patient blowing through the mouth-piece. An elongated longitudinal slot 20 is formed in the tube 12 and extends the major portion of the length of the tube 12. Mounted in a bushing 22 on the closed end 14, and extending through a web 26, is a shaft 28.

Opposite the slot a plate 30 is slidably disposed on the shaft 28 and substantially fills the tube 12 though the peripheral edge thereof is spaced from the inner peripheral walls of the tube by a slight amount. The plate 30 engages the base 34 of a pin 36 which rides in the slot 20 so that an indicator 38 attached to the pin 36 will move upwardly with the plate and cooperate with suitable indicia 40 on the outside of the tube 12 to indicate the strongest breath blown into the tube during a particular period.

A spring 42 preferably in the form of a coil spring biases the plate 30 and has its other end engaged with the bushing 22, so as to normally urge the plate to its initial position as shown in FIG. 2. As breath enters the open end 16 the spring 42 will be compressed. The pin 36 will ride in the slot 20 so that when the plate 30 has been pushed in the maximum amount, the pin 36 will remain in the extended position even after the plate has returned to an initial position. The spring 42 and the indicia 40 will have been so calibrated that the indicator 38 will provide a direct readout in feet per second or of the actual speed of the air entering into the tube 12 and therefor a relatively accurate indication of the strength of the patient's lungs is obtained.

The mouthpiece has a horizontal portion 50 and a vertical portion 52 detachably secured to the tube 12. The horizontal portion 50 includes a tapered mouth part 54 adapted to seat between a patients lips and a bellows part 56 for accommodating and regularizing the breath puffs of the patient to prevent instantaneous peaks from being registered and requiring a slight period of maintenance of the force of the patient's breath to provide a truer indication of lung capacity. The mouthpiece may be replaced and sterilized as desired and is preferably formed of a rubberlike resilient material including any suitable synthetic plastic.

A latitude of modification, substitution and change is intended in the foregoing disclosure, and in some instances, some features of the present invention may be employed without a corresponding use of other features.

We claim:

1. A pulmonary achievement trainer for registering the strongest breath attained by a patient during a predetermined period comprising a vertically extending tube having an open lower end and a longitudinal elon-

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gated slot, a mouthpiece detachably connected to said tube and forming an air intake, said mouthpiece being of substantially L-shaped configuration having a portion extending vertically and a portion extending horizontally said vertically extending portion being sealingly connected to the open lower end of said tube, said horizontal portion having a bellows shaped section, a plate horizontally disposed in said tube, guide means in said tube and in said plate for movably mounting said plate for vertical motion along a constrained path within said tube, spring means in said tube engaging said plate

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for resisting an upward movement of said plate, indicia on said tube adjacent to said slot, indicator means engaged in said slot, said indicator means having means engageable by said plate, said indicator extending outwardly of said tube cooperating with said indicia to visually indicate the amount of movement of said plate, and frictional means for retaining said indicator in a position corresponding to the furthest movement from the initial position attained.

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