

[54] **PORTABLE STAND WITH MAGNETIC BAR
SURGICAL INSTRUMENT HOLDER FOR
USE ON AN OPERATING CART OR TABLE**

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423**

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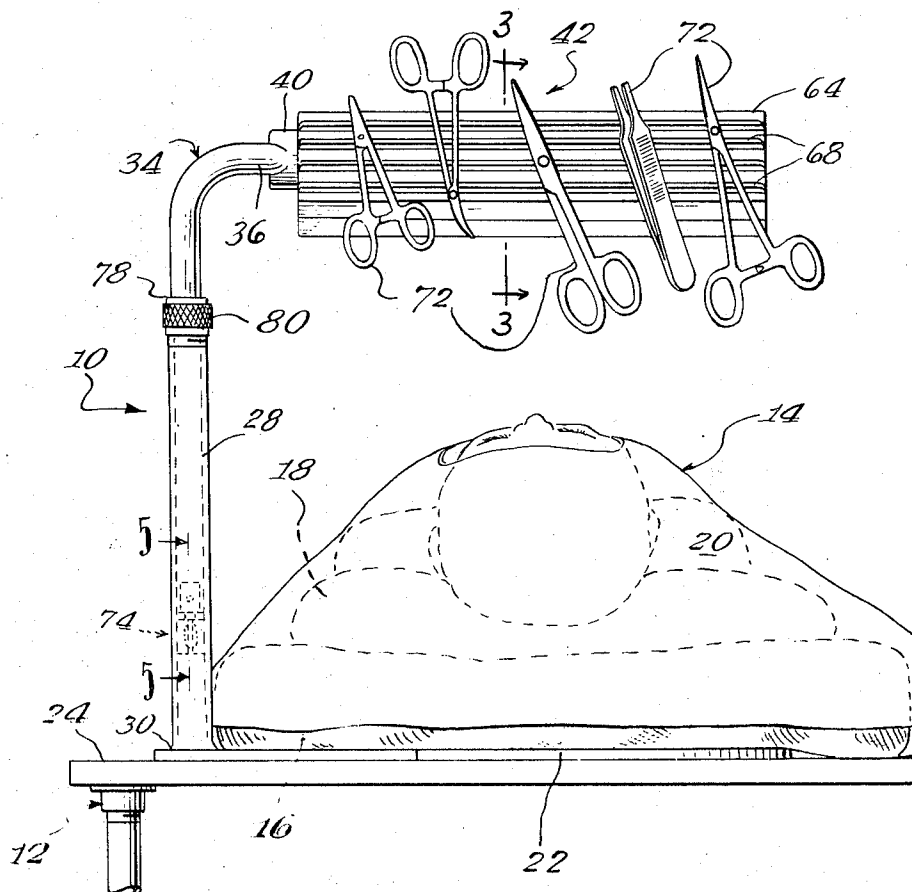
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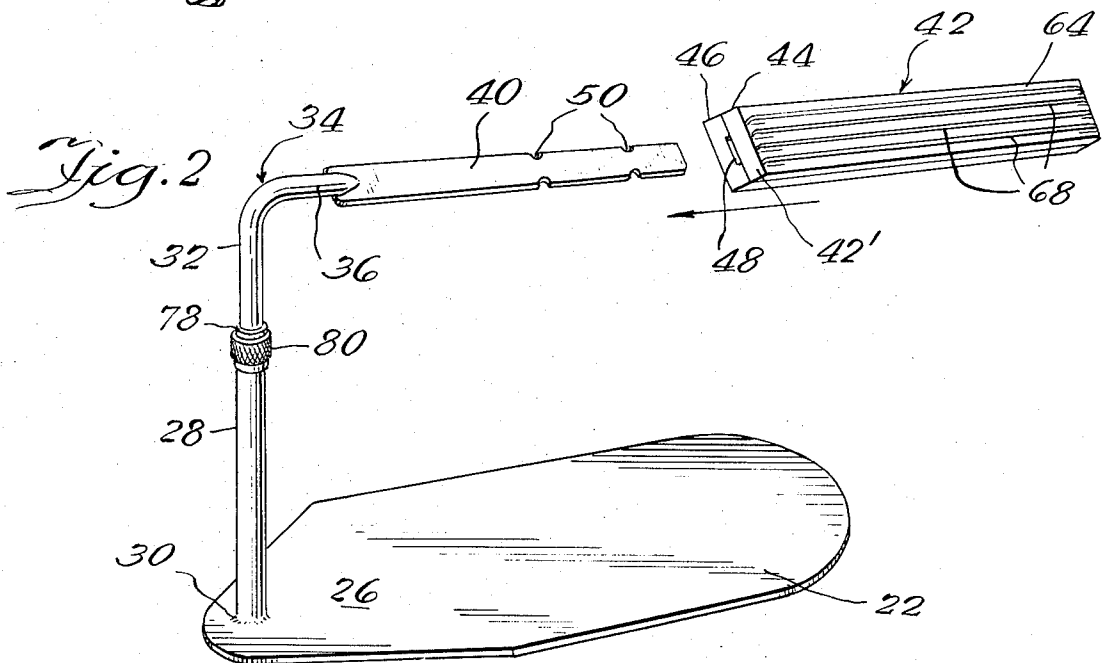
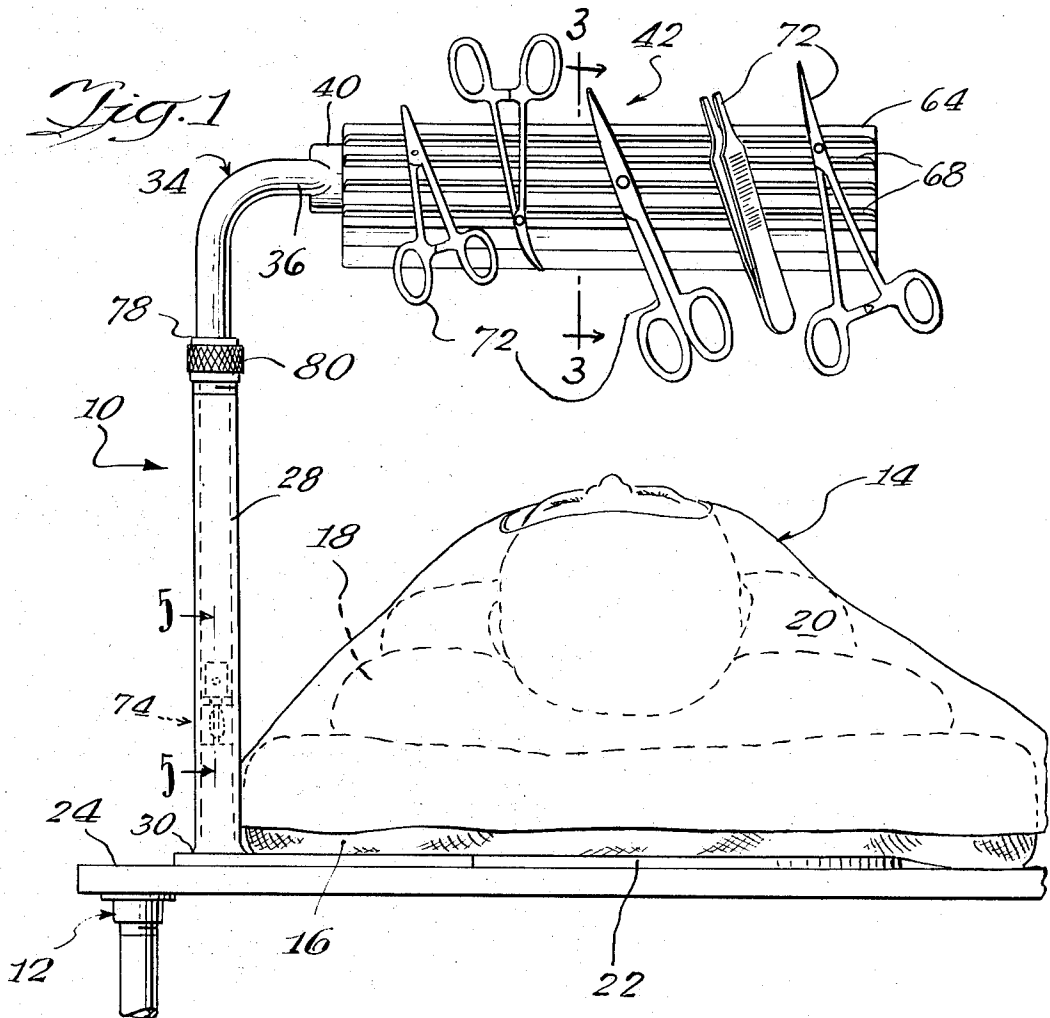
[57] **ABSTRACT**

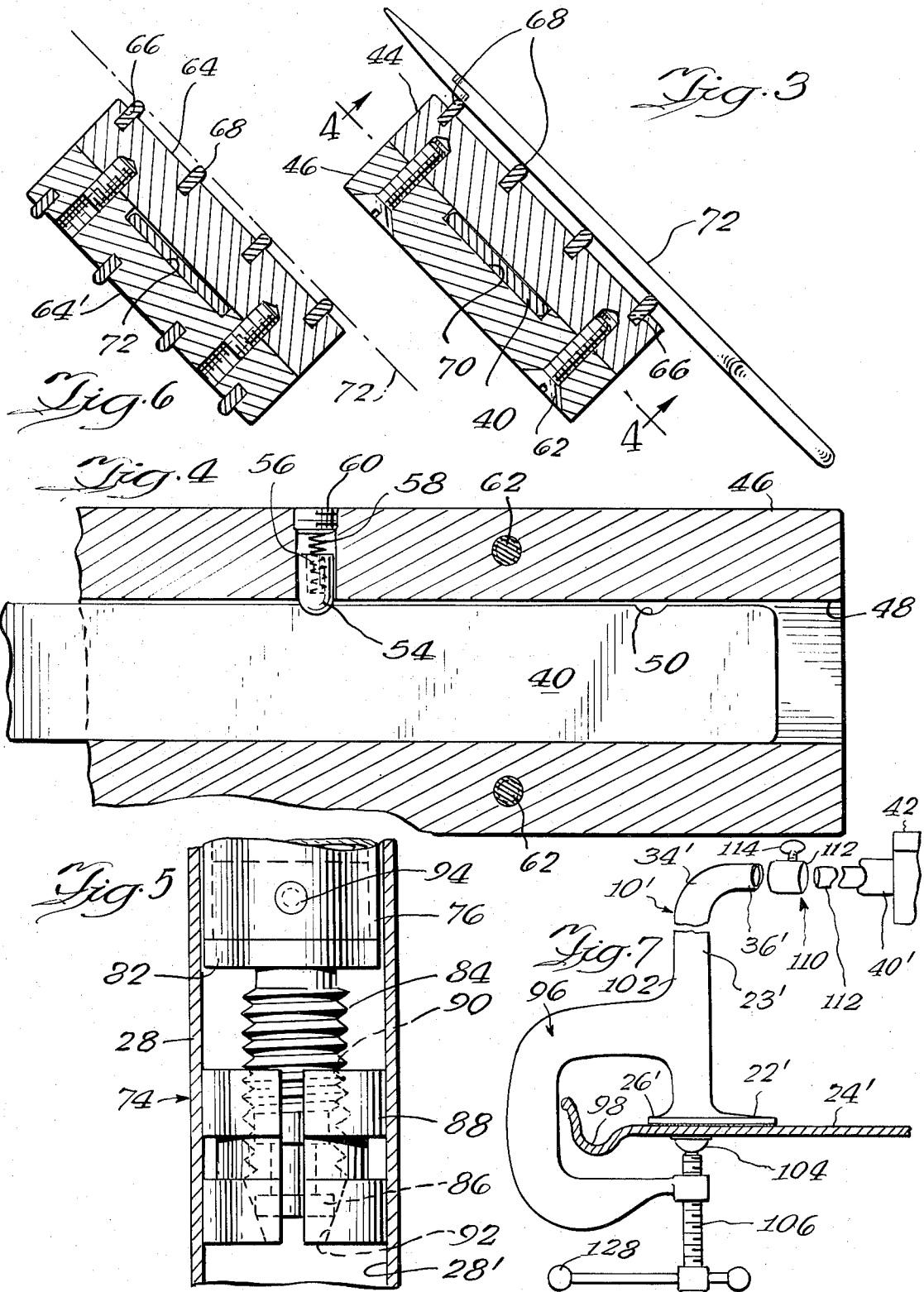
A portable stand with a removably coupled magnetic surgical tool holder arranged to overlie the patient on an operating cart and present a magnetic purchase for surgical instruments to be held within convenient reach of the operating surgeon. The stand has a flat base plate or platform capable of being engaged beneath the mattress supporting the patient on the operating cart. The holder includes an autoclave sterilizable bar member having a magnetic purchase surface for the surgical instruments canted at about 45° relative to the plane of the mattress so that the tools held thereon are oriented most conveniently relative to the operating surgeon. The distance of the bar member relative to the platform is variable by suitable adjustment means. Means may be provided for varying the angle of the bar member relative to the plane of the table or cart.

A modified embodiment of the stand is provided having suitable means for clamping the stand to a veterinary surgical table for veterinary surgery. In this embodiment, means are provided for adjusting the angle of cant of the bar member relative to the table, the head of which usually is lowered about 30° to prevent aspiration in the event the animal being operated should have an emesis.

6 Claims, 7 Drawing Figures







PORTABLE STAND WITH MAGNETIC BAR SURGICAL INSTRUMENT HOLDER FOR USE ON AN OPERATING CART OR TABLE

FIELD OF THE INVENTION

This invention relates generally to a surgical instrument or tool stand and more particularly, concerns a novel, portable, surgical instrument stand adapted to be removably installed on an operating cart in emergency-room treatment situations or on a veterinary surgical table and having removable, sterilizable magnetic means for holding the surgical instruments conveniently oriented relative to the operating surgeon.

BACKGROUND OF THE INVENTION

Patients brought to a hospital or emergency treatment center for immediate surgical attention, such as suturing for cuts and lacerations and other procedures require the services of the skilled surgeon and his assisting surgical nurses or interns swiftly and without faltering or errors. The surgeon's directions as to surgical instruments he requires must be met quickly and accurately, the assistant handing each tool to the surgeon and withdrawing same on demand. Many surgical tools, such as forceps, needle holders, scissors, and the like, are repeatedly used in broken sequence in the course of a particular operating procedure. These tools are and must remain sterile during the operation. The tools may be repeatedly handled, picked up and set aside as needed. Such multiple handling often occasions the dropping of one or more of the surgical tools thereby terminating their sterile condition and requiring a fresh sterile tool and perhaps a new setup. Since speed of treatment and completion of emergency procedures is a mandatory goal in order to render maximum care to the patient, elimination of lost motion and lost time caused by such occurrences is desirable.

Time being of the essence, and the maximum utilization of the available skilled medical and nursing personnel being highly desirable, if the requirement for the exclusive and undivided attendance of skilled personnel upon the operating surgeon as assistants or intermediaries in handling the surgical tools were materially reduced or perhaps eliminated, much increase in effectiveness and efficiency would result.

Any means provided for supporting sterile surgical tools so as to eliminate the tool handling assistance by medical personnel should be versatile, adaptable for use in different situations, afford purchase security and be capable of sterilization and maintenance of such sterile condition.

The invention is directed to providing a surgical instrument or tool stand meeting the above criteria so as to reduce previously mandatory skilled, assistant medical personnel to the operating surgeon for surgical instrument handling purposes.

The invention also is provided with clamping means for mounting on a veterinary surgeon's table where assistant medical personnel rarely are employed thereby eliminating any need for such personnel in surgery situations.

A portable stand adapted to be removably installed on an operating cart in the emergency room of a hospital or like emergency treatment location and comprising a flat base or platform, a vertical standard secured to the platform at one end thereof and including an elbow, one end of which is coupled to the standard and

the opposite end having a magnetic surgical instrument holder removably coupled thereto. The holder is oriented over the patient on the cart and is mounted so that its magnetic surface is inclined about 45° relative to the plane of the operating cart to present a secure, magnetic purchase for surgical tools within convenient reach of the surgeon. Means are provided for adjusting the height of the tool holder means relative to the cart and for varying the horizontal position of the tool holder means relative to alignment thereof with the patient. When installed, the base or platform is sandwiched between the cart's table surface and the mattress and retained in place by the combined weight of the mattress and patient on the mattress.

The stand may be provided with means for adjusting the angle at which the magnetic surface of the holder is inclined relative to the plane of the operating table.

The portable stand embodying the invention also is adapted to be used on a veterinary surgical table by including clamp means for installing the stand along one longitudinal edge of the table. Means for adjusting the angle of inclination of the holder bar is provided to accommodate the fact that the head of a veterinary surgical table usually is inclined downwardly about 30° to prevent aspiration in the event the animal being operated should have an emesis.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of the portable stand constructed in accordance with the invention and illustrated installed on an operating cart in an emergency room situation.

FIG. 2 is an exploded, perspective view of the portable stand of FIG. 1.

FIG. 3 is a sectional view taken along line 3—3 of FIG. 1 and in the general direction indicated.

FIG. 4 is a fragmentary sectional view taken along line 4—4 of FIG. 3 and in the general direction indicated.

FIG. 5 is a sectional view taken along line 5—5 of FIG. 2 and in the general direction indicated.

FIG. 6 is a sectional view taken through the holder of a modified form of the invention.

FIG. 7 is a fragmentary exploded view of a modified form of the invention.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the drawings, the portable stand constructed in accordance with the invention is illustrated in FIG. 1 as employed in an emergency room treatment situation. The portable stand is designated generally by reference character 10 and is shown arranged on a conventional cart 12 (only partially illustrated herein). As illustrated, the patient 14 in need of emergency surgical treatment for facial lacerations for instance, is supported on cart 12 resting upon a mattress 16 with his head resting upon a pillow 18 and a sterile "eye-sheet" 20 appropriately draped to define an operating field.

The instrument stand 10 has a flat base or platform 22 frictionally sandwiched between the top 24 of cart 12 and mattress 16. The base 22, preferably formed as a flat metal plate, has a tapered end portion 26 having a hollow, tubular pipe or standard 28 secured upright near the apex thereof by welding, for example, as shown at 30. One arm 32 of an elbow 34 is telescopically received within the standard 28. The other arm 36

terminates in a forked portion 38 within which a relatively flat elongate blade 40 is secured.

The tool holder, generally designated by reference character 42, is formed of a pair of matched, generally rectangular plates 44 and 46 which are assembled together. The assembled holder 42 has a longitudinal slot 48 centrally formed therein, said slot having a cross-sectional configuration selected to accommodate said blade 40. The blade 40 is telescopically or removably engaged within holder 42. The holder 42 is formed of aluminum or other non-magnetic, autoclavable material. The blade 40 is provided with a pair of spaced apart recesses or notches 50, each opening to one edge of the blade 40. Each recess 50 cooperates with detent means 52 mounted to the holder 42 for detachably securing blade 40 in holder 42 in at least two positions therealong. In this manner, the horizontal positioning of the holder 42 relative to the patient can be adjusted to at two positions. It will be noted that slot 48 opens to at least one end face 42' of holder 42. Preferably, slot 48 opens to both ends of the holder so that it is a reversible unit.

The detent means 52 is illustrated in detail in FIG. 4 and comprises a detent member 54 having a free end configuration conforming to the configuration of a recess 50. A socket 56 is formed in the opposite end of the detent member 42 and one end of a coil spring 58 is seated within the socket 56, with the opposite end of the spring 58 secured to a screw 60. The spring 58 biases the free end of the detent 54 into the passageway 50 so that the detent 54 is urged against the opposing edge of blade 40 and is seated within one of the recesses 50 to fix the horizontal position of the holder. Tension on spring 58 may be adjusted by manipulation of screw 60.

The plates 44 and 46 are secured together by screw means 62 to form the tool holder 42. One surface 64 of plate 44 has a plurality of parallel, longitudinal grooves 66 formed therein.

A like number of strips 68 of a suitable magnetic material are seated within said grooves 66. Strips 68 are relatively flat and each is disposed along one edge thereof within the grooves so that edge portions outwardly extend from the plate surface 64.

A channel 70 is formed between the longitudinal edges of plate 46. Channel 70 is of size and configuration conforming to the size and configuration of blade 40 so as to define the slot 48 when the plates 44 and 46 are assembled. The surgical instruments 72 are laid upon the exposed edges of the magnetic strip materials and are held by the magnetic field created thereby. Obviously, channel 70 may be provided by cooperating channel formations in both plates 44 and 46.

The blade 40 is arranged at an angle of about 45° relative the vertical axis of the standard or upright 28 so that the holder 42 will be inclined also. This inclination provides a magnetic purchase surface for instruments 72 which is convenient and suitable for the reach of the surgeon. The instruments are retained on the magnetic surface of holder 42. The magnetic field defined by strips 68 is sufficiently strong to hold the surgical instruments without sliding and with the handles thereof free and exposed, as illustrated to permit the surgeon to reach for and grasp same, as he requires. The instruments 72 are readily removed from and replaced on the holder 42 so as to eliminate the need for an intermediary handling the instruments.

The height at which the tool holder 42 is disposed above platform 22 is adjustable by manipulation of sleeve clutch means 74 illustrated in detail in FIG. 4. A tubular intermediate member 76 is arranged telescopically within the upright 28 for rotation relative thereto. The upper end of said tube 76 carries a collar 78 having a knurled circumferential surface 80 to permit grasping thereof. The lower end of the tube 76 is blocked by a floor 82 from which threaded body 84 depends. The threaded body 84 terminates in a bearing end formation 86. A split sleeve body 88 having a threaded bore 90 is engaged with said threaded body 84, the bore 90 having a conical section 92 of gradually decreasing cross-section. The arm 32 of elbow 34 extends sufficiently to engage telescopically within the intermediate tubular member 76 bottoming upon the floor 82. The thread body 84 may be a bolt which passes through a suitable passage in floor 82 and fastened to tube 76 by set screw 84.

Rotation of the tubular member 76 by manipulation of collar 78 causes the split sleeve 88 to move along the threaded body 84. The bearing end formation 86 of the body 84 engages that portion of inner wall of the sleeve 88 which defines the conical section 92 of bore 90, causing the sleeve 88 to expand frictionally to engage the inner wall 28' of the upright 28.

Rotation of the tubular member 76 in the opposite direction, releases the frictional engagement of the sleeve 88 with the wall 28', and the member 76 may be raised or lowered as desired, carrying therewith, the elbow 34 so as to position the tool holder 42 at any desired height above the platform 22.

The stand 10, as shown, is sufficiently light in weight as to be portable, and, is easily accommodated upon the standard patient supporting cart. Floor models may be provided simply by lengthening the standard 28.

A modified form of the invention is illustrated in FIG. 6 in which both opposite surfaces 64, 64' of the holder 42 carry parallel magnetic strips seated in suitable longitudinal grooves formed therein. Here, socket screws are used to couple the two plates 44 and 46 together and countersunk so as not to interfere with the magnetic purchase surface of the holder.

Means other than specifically described and illustrated herein may be used to enable adjustment of the height of the holder 42. A familiar thumb screw passing through the tube 28 and bearing against the arm 32 may be utilized in lieu of the sleeve clutch means 74.

The material used for the construction of the bar is not limited to aluminum but should be capable of being sterilized by autoclave methods or other accepted hospital procedures without deteriorating. The magnetic strips 64 can be replaceable.

The angle of inclination of holder 42 is selected to be about 45° relative to the longitudinal axis of the standard or plane of the cart top 24 since at such angle, ease of manipulation, that is, grasping of the tools, is very convenient for the surgeon. However, any other angular disposition of the magnetic purchase surface for the tools 72 is satisfactory so long as the strength of the field is sufficient to provide security against falling of the tools therefrom.

A modified form of the invention is illustrated in FIG. 7 and is designated generally by reference character 10'. The instrument stand 10' is particularly adapted to be used on a veterinary surgical table by provision of clamp means 96 for installing the stand 10' along one

longitudinal edge of the table 12'. Mattresses ordinarily are not used upon veterinary surgical tables, such tables commonly being provided with a trough, such as shown at 98, along a longitudinal edge. Accordingly, the clamp means 96 comprises a C-clamp 100 having one arm secured fixedly to the upright 28' at a location near its lower end, as shown at 102. The C-clamp 100 is arranged to extend outwardly of the tapered end 26' of base 22' to encircle the trough 98 so that the bearing end 104 of threaded part 106 engages the underside of table top 24' and is adapted to be tightened thereagainst by manipulation of handle 108.

The head of a veterinary surgical table usually is inclined downwardly about 30° to prevent aspiration in the event the animal should have an emesis. Accordingly, means 110 are provided for adjusting the angle of the holder bar to provide a purchase surface canted 45° relative to the axis of the upright 28' independent of the plane of the operating table top at which the magnetic surface of the holder 42 is inclined relative to the plane of the surgical table.

Elbow 34' of instrument stand 10' includes arm 36' adapted to be telescopically engaged within the tubular end 112 of blade holder 114. The tubular end 112 is capable of being rotated relative to the arm 36' so that the blade 40' carried thereby is capable of being canted at any angle relative to the operating table 24'. Band type clamp means 112, including thumb screw 114, is provided to engage about the tubular end 112 to permit tight securement of the said end 112 to arm 36' when the arm 36' is engaged therewithin with the blade 40' oriented at the desired angle. Thus, manipulation of the thumb screw 114 to release the coupling between end 112 and arm 36' permits the blade 40' to be inclined at any desired angle relative to the base 22'. When the desired orientation of the blade 40' has been achieved, the thumb screw 114 is tightened and the coupling fixed. As has been noted heretofore, the angle of the blades 40 and 40' generally determine the angle at which the purchase surface of holders 42 and 42' is arranged.

What it is desired to be secured by Letters Patent of the United States is:

1. In combination with a medical tool stand of the type to be placed on a portion of a patient supporting surface such as a hospital cart employed in emergency rooms, a flat base having planar surfaces formed thereon, a vertically arranged support formation upstanding from said base, a member forming an elbow positioned at the upper portion of said vertical support formation, one arm of said elbow vertically adjustably

coupled to said support formation, medical instrument holder means removably mounted on the other arm of said elbow member, said holder means having at least one substantially planar surface having magnetic means disposed thereon for removably engaging medical instruments, said other arm and holder means extending over said patient supporting surface spaced from and in close juxtaposition to a patient's body, said base member extending from the bottom of said vertical support formation parallel to said other arm and medical tool holder means and extending in the same direction therewith to form a substantially U-shaped unit to underly said patient and adapted to be sandwiched between said patient and said supporting surface and resting on said surface to form the sole support for said base, vertical support formation, elbow and said medical tool holder.

2. The structure of claim 1 in which said vertically arranged support formation is hollow and said one arm of said elbow is telescopically received within said vertical support formation.

3. The structure of claim 1 in which said further means are provided for selectively adjusting the height at which said medical tool holder means is disposed relative to the base and cooperating means of said medical tool holder means and said other arm for selectively adjusting the position of said tool holder means along said other arm.

4. The structure of claim 3 wherein said means for selectively adjusting the height at which said medical tool holder means is disposed comprises expandible sleeve clutch means coupled within said stand and said one arm.

5. The structure of claim 3 wherein said means for selectively adjusting the position of said medical tool holder means along said other arm comprises spring biased detent means arranged between said tool holder means and said arm.

6. The structure of claim 1 wherein said cooperating means comprises an elongate blade member on said other arm and a longitudinal slot in said medical tool holder means configured to receive said elongate blade member snugly therein, and spring biased detent means secured on said medical tool holder means to extend into said slot in bearing relation to said elongate member, said elongate member having spaced recesses formed along the length thereof and said spring biased detent means adapted to be biased for seating selectively within said recesses.

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