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CLOTH CUTTING MACHINE

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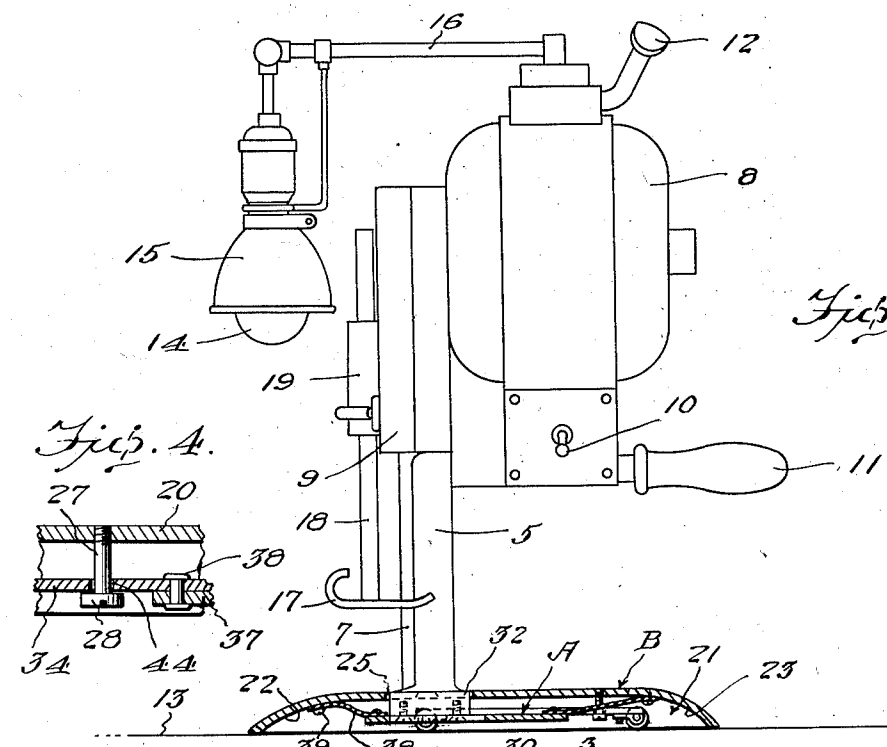


Fig. 1.

Fig. 4.

Fig. 2.

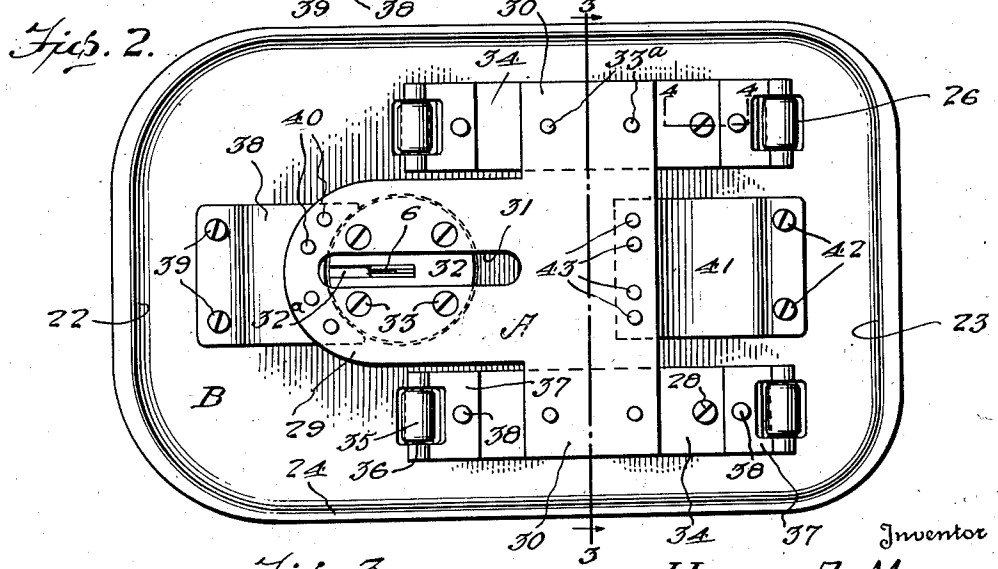
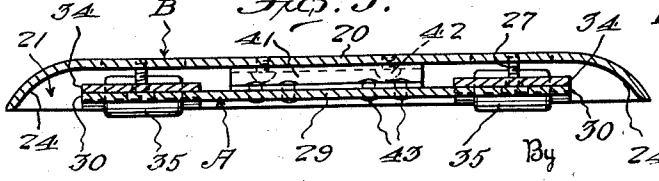


Fig. 3.



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CLOTH CUTTING MACHINE

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This invention relates to portable cloth cutting machines of the character that are manually moved and guided by a workman on a cutting table while cutting piles or multiple layers of cloth simultaneously to a particular pattern. In these machines the cutting is performed by a vertically reciprocating cutting knife which is driven by a high speed motor and consequently there is a terrific vibration in the machine that prematurely wears the moving parts, makes the machine difficult to control, and creates considerable noise that disturbs the workmen.

Heretofore in machines of this character, incorporated in the structure is a composite shoe or face plate which is pushed about in control of the workman between the lowermost layer of the pile of cloth and the top of the table and it is essential that the shoe slide or move, with the least amount of friction, under the cloth.

It has been customary to mount the standard which carries the entire weight of the cutting machine parts, including the knife, motor, and transmission mechanism, upon one of the parts of this shoe or face plate. In doing so it has been difficult and expensive to dampen the vibration in the parts of the shoe and at the same time have a smooth contour on the surface of the shoe so that the cloth will not catch underneath the foot plate while the machine is being manipulated by the workman. Any irregularity in the contour in the surface of the shoe caused by one part thereof yielding relative to another is likely to cause lack of uniformity in the cut patterns because of the angular deviation in the thickness of the pile relative to the rectilinear motion of the knife.

In the better known and practical cutting machines of this character the shoes are made with hinged or floating lifter rims and a central concentric panel to form one continuous surface and the standard is supported on the central panel. Supporting rollers are usually carried directly and in fixed relation by the central panel or both the central panel and the rim with cushioning means to absorb the vibration between the rollers and the panel or rim. In such constructions it is of necessity that the rim and panel move relative to each other which not only distorts the surface over which the cloth is obliged to slide but leaves exposed edges on one or the other of the parts which catch in the cloth; and even in the most efficient of the composite shoe constructions their design requires meticulous precision in matching the confronting edges to fit snugly and slide under the lay of the cloth without catching, and yet allow for the rise and fall of the machine, all of which entails increase in cost of the machine.

It is the aim of the present invention to overcome these objections by connecting the lower end of the standard to a separate carriage frame which is properly cushioned relative to the rollers or casters which support the frame and then mount a foot plate above the carriage on shock absorbing mountings so that no part of the weight of the machine bears on the foot plate.

The construction of the present invention provides a rigid foot plate which yields bodily relative to the carriage frame and only requires a relatively small opening in its surface to allow the standard to pass with sufficient clearance to permit the standard to rise and fall all of which presents the maximum of unbroken surface over which the cloth slides.

Another feature of the invention is to provide the foot plate with sufficient area to furnish a cover for the carriage, and to form the foot plate with a depending skirt effective to prevent the bottom layers of the pile of cloth from getting under the edges of the plate and ruining valuable fabric.

A further object of the invention is to provide suitable stops coacting with the foot plate and the roller spring straps to overcome lift in the shoe plate when the rollers pass over any uneven surfaces on the top of the cutting table.

Further objects of the invention are to provide such a machine that is strong, compact, and well balanced, thoroughly reliable in performance, and economical to manufacture; and, although the invention will be explained in connection with the preferred embodiment, as shown in the drawing, it is to be understood that changes, variations, and modifications may be resorted to without departing from the spirit and scope of the invention in the appended claims.

In the drawing wherein like reference numerals indicate like parts throughout the several views:

Fig. 1 is a side elevation partly in vertical section of a portable cutting machine embodying the features of the present invention.

Fig. 2 is an enlarged bottom plan view thereof.

Fig. 3 is a transverse vertical section in upright position taken substantially on the plane of line 3—3 of Fig. 2.

Fig. 4 is a fragmentary longitudinal vertical section in upright position taken substantially on the plane of line 4—4 of Fig. 2, looking in the direction of the arrows and illustrating the functions of the limit stop members.

In the drawing, the numeral 5 indicates a regulation pedestal or standard of a conventional cloth cutting machine. In a guideway 6 on the front side of the standard is mounted for vertical reciprocating movement a cutting knife 7. At the upper end of the standard is mounted an electric motor 8 that drives the knife 7 by means of suitable transmission, such as a crank and pitman, housed in a casing 9 secured to the motor 8. Carried by the motor is the usual control switch 10 and handles 11, 12, which are grasped by the workman in pushing and guiding the cutting machine over the top of the cutting table 13. An electric light 14 supported forwardly of the standard has a reflector 15 which directs the illumination in front of the cutting knife 7. The electric light is supported on a right angled arm 16 which is connected to the top of the motor from where the light receives the electric current. The machine also has a regulation bifurcated presser foot 17, the prongs of which straddle the cutting edge of the knife 7 and also the forward portion of the standard. The presser foot is secured to the lower end of an arm 18 which is adjustably connected to the casing 9 as at 19, whereby the presser foot may be adjusted vertically to accommodate the thickness of the lay or pile of cloth on which it bears when the machine is cutting through the pile or lay. It will be seen that in this usual construction, the standard extends vertically, and the motor extends rearwardly at right angles to the standard, thereby creating a top heavy construction which carries the weight rearwardly.

In my construction there is a cruciform carriage frame A which supports the entire weight of the standard 5 carrying all of the parts of the machine. A foot plate or lifting shoe is indicated at B. The plate is made of metal, preferably as a casting, and has sufficient rigidity to prevent distortion by the weight of the pile of cloth under which it slides while being manipulated by the workman. The foot plate is rectangular in outline and its length is disposed in the direction of travel. This foot plate B has a flat central portion 20 the perimeter of which merges with an integral continuous depending skirt forming a cavity or open chamber 21 for the carriage frame A. The edges of the skirt terminate in the plane of the table top to insure a positive lift of the fabric off the table to the knife. Should any fabric get under the skirt it would distort the cutting and spoil valuable goods.

The toe or forward end 22 of the skirt is slightly rounded to a relatively large radius to provide a gently sloping lift or ramp up which the pile of cloth slides when the machine is manipulated. The heel or rear end 23 of the skirt curves downwardly on a relatively short radius making more of an abrupt drop than the toe end. The opposite sides 24 of the skirt curve downwardly on a radius shorter than either the toe or heel making a considerable shoulder at the sides of the foot plate.

There is an opening 25 in the flat central portion 20 between the center and the ramp 22 along the longitudinal median. Through the opening extends the lower portion of the standard 5 and is in the present design circular in configuration allowing a clearance for any wabble that may occur in the standard. The flat portion 20 of the foot plate may be provided with four openings 26 situated above the rollers about to be described which allow the rollers clearance in event unusual weight is encountered in the pile of cloth being cut. Near the juncture of the heel 23 of the skirt with the flat portion 20 and next to the sides 24 of the skirt there is a threaded opening or socket, one adjacent each side, in which is screwed the threaded end of a shank 27 of an abutment or stop member. The shank is of predetermined length, extends downwardly a portion of the depth of the chamber 21 and on the inner end each has a large head 28 formed with a kerf to receive the blade of a screw driver with which the stop member is attached to the foot plate.

The carriage frame A is made of a flat rigid metal plate of cruciform outline having a stem or post portion 29 and integral lateral wings 30—30 at one end. The foot plate B is mounted over the frame A, as will presently appear, so that there is a space between the lower face of the shoe plate and the upper face of the frame, to furnish clearance to accommodate the rise and fall of the weight of the machine when the frame yields bodily.

In mounted relation the carriage frame is positioned horizontally with the stem portion 29 along the longitudinal median of the foot plate having a portion under the opening 25. There is a slot 31 in the stem portion 29 extending across the opening 25 to accommodate the reciprocation of the end of knife 7.

On the lower end of the standard 5 is a circular flange 32 which is cut out at 32*a* to accommodate the guideway 6 and the knife 7. The flange and lower end of the standard project through the opening 25 and the flange is detachably connected by screws 33 to the forward portion of the stem 29. From this construction it will be seen that the weight of the entire machine is carried forwardly of the centers of the foot plate and also the center of the carriage frame which counterbalances the weight of the motor carried to the rear of the standard 5.

The free end of each wing 30 is riveted at two places to resist torque at 33*a*, to the centers of the lower faces of the roller springs or brackets 34, one for each wing. The roller springs are preferably made of flat spring steel straps and are superimposed on the wings. If desired, instead of using springs, wings extending in the same manner as the roller springs 34, with the rollers mounted therein, may be used.

These roller springs extend forwardly and rearwardly on each end of the wings in parallel relation to the stem 29 and at right angles to the wings. The roller springs bow downwardly under weight and are laterally of the longitudinal median of the carriage frame and the foot plate. On the opposite end of each roller spring is mounted a ball bearing roller or caster 35 there being four in number. The rollers are positioned, one under each opening 26, in the foot plate and each of them is rotatably supported on its pin or shaft 36, the ends of which are secured in bearing ears on the bearing brackets 37, there being one bearing bracket riveted at 38 on the opposite end of each roller spring. There is a space between the upper faces of the roller springs 34 and the lower confronting face of the flat portion 20 of the foot plate B, when there is no weight on the foot plate. Under working conditions this space is maintained by yielding mountings hereinafter described. It will be seen that the continuous skirt overhangs the carriage, roller

springs and rollers and prevents the cloth being ruined.

There is one yielding mounting for the front and another for the rear of the foot plate. The front yielding mounting is made of a relatively wide plate **38** of spring steel. The front edge of the plate is detachably secured to the underside midway up the ramp **22** by two spaced screws **39**. The rear end of spring plate **38** is fastened to the upper margin of the front end of the stem **29** by a series of rivets **40**. The rear yielding mounting is a spring steel plate **41** substantially the same as the front yielding mounting with the exception that it is slightly longer. The rear end of plate **41** is detachably secured to the underside of the flat portion **20** near the juncture with the heel part **23** by two screws **42**. The inner end of plate **41** is secured to the rear end of the carriage frame A between the wings **30—30** by a series of rivets **43**. The spring plates **38—41** are mounted along the longitudinal median of the foot plate B and the carriage frame A and in each there is an offset in the free portions providing a compound curvature which is clear from an inspection of Figures 1 and 2. The width of the spring plates **38—41** are about the same and they are about the same as the diameter of the flange of the standard which is secured to the stem **29**. The spring plates **38—41** allow the foot plate B and frame A to yield bodily, relative to each other, in a vertical direction, and support the foot plate in spaced relation above the carriage frame A.

There is an opening **44** in the rearwardly extending free portion of each roller spring **34** which embrace the shanks **27** of the limit stop members in slidable relation. These stop members are in the nature of screws and the shanks **27** are preferably round. The shanks extend one through each opening and the heads **28** on each form shoulders which bear against the lower face of the roller springs and limit the distance between the carriage frame and the foot plate. In event the cutting table would have an uneven surface the stops would hold the foot plate to the carriage frame and prevent upward lift in the foot plate when the rollers passed over the uneven surface. The length of the shanks **27** permit freedom of movement between the carriage frame and the foot plate because the roller springs ride up and down the shanks between the lower face of the foot plate and the heads **28**.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a portable cloth cutting machine, the combination with cutting means and power operating mechanism, of a mobile support for said operating mechanism, and upon which said mechanism is mounted, a foot plate surmounting said support, and yieldable means connecting said plate to said support.

2. In a portable cloth cutting machine, the combination with cutting means and power operating mechanism, of a wheeled mobile support for said operating mechanism, and upon which said mechanism is mounted, a foot plate surmounting said support, and yieldable means connecting said plate to said support.

3. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a yielding mobile carriage frame connected to and supporting the standard, and a foot plate surmounted on the carriage frame and having an opening through which the standard extends.

4. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a yielding wheeled carriage frame connected to the lower end of the standard, a foot plate mounted above and on the carriage frame and having an opening through which the standard extends, and yielding mountings connected to the foot plate and the carriage frame.

5. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a cruciform horizontally disposed carriage frame including a stem portion and opposed wings, the lower end of said standard connected to the stem portion and the frame supporting the entire weight of the parts carried by the standard, spring straps connected to the wings one to each wing, rollers carried by the ends of the springs, a shoe plate supported above the carriage frame and having an opening therein through which the standard extends, and spring plates connecting the shoe plate and the carriage frame.

6. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a flat horizontally disposed carriage frame of cruciform outline and including a stem portion and wings, the lower end of said standard connected to the stem portion and the frame supporting the entire weight of the parts carried by the standard, flat spring straps extending in a direction parallel to the stem portion and connected at their centers one to each wing, rollers mounted one on each end of each spring strap with their axes at right angles to the stem and straps, a foot plate disposed in spaced relation above the carriage frame and being of rectangular configuration, the center line of said stem portion being disposed along the longitudinal median of the foot plate, spring plates connecting the ends of the stem portion with the confronting portions of the foot plate adjacent the ends of the latter, and said foot plate having a depending continuous skirt surrounding the carriage frame, rollers, and spring straps.

7. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a rigid carriage frame yieldingly supported on wheels and on which frame the standard is mounted, a foot plate mounted above and on the carriage frame and having an opening through which the standard extends, said foot plate being of greater area than the carriage frame and having a continuous depending skirt around the margin surrounding the frame and wheels, and yielding mountings connecting the confronting portions of the carriage frame and foot plate.

8. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a yielding wheeled carriage frame connected to the lower end of the standard, a foot plate mounted above and on the carriage frame

and having an opening through which the standard extends, yielding mountings connected to the foot plate and the carriage frame, and means carried by the foot plate and coacting with the carriage frame to limit the yielding movement of the foot plate in one direction.

9. In a portable cloth cutting machine, the combination with a vertical standard carrying a motor, a reciprocating knife, and power transmission mechanism connecting the motor and knife, of a rigid carriage frame yieldingly supported on wheels and on which frame the standard is mounted, a foot plate mounted above and on the carriage frame and having an opening through which the standard extends, said foot plate being of greater area than the carriage frame and having a continuous depending skirt around the margin surrounding the frame and wheels, yielding mountings connecting the confronting portions of the carriage frame and foot plate, and means carried by the foot plate and coacting with the carriage frame to limit the yielding movement of the foot plate in one direction.

10. A foot plate construction for cloth cutting machines comprising a substantially rigid, carriage frame adapted to mount and support the operating cutter mechanism of the machine, an inverted dished foot plate cover substantially enclosing said frame, and having an opening through which the operating mechanism will extend, and yieldable means connecting said cover and frame, whereby to absorb vibration.

11. A foot plate construction for cloth cutting machines comprising a substantially rigid wheeled mobile carriage frame adapted to mount and support the operating cutter mechanism of the machine, an inverted dished foot plate cover substantially enclosing said frame, and having an opening through which the operating mechanism will extend, yieldable means connecting said cover and frame, whereby to absorb vibration, and means to limit relative movement between said frame and said cover when said connecting means yields.

12. A foot plate construction for cloth cutting machines comprising a substantially rigid, carriage frame, yieldingly supported on wheels, adapted to mount and support the operating cutter mechanism of the machine, an inverted dished foot plate cover substantially enclosing said frame, and having an opening through which the operating mechanism will extend, and yieldable means connecting said cover and frame, whereby to absorb vibration.

13. A foot plate construction for cloth cutting machines comprising a substantially rigid, carriage frame having a main body portion, and wings extending therefrom, said body portion being effective to mount and support the operating cutter mechanism of the machine, wheels carried by said wings to support said construction for mobility, an inverted dished foot plate cover substantially enclosing said frame and having an opening through which the operating mechanism will extend, and yieldable means connecting said cover and frame, whereby to absorb vibration.

14. A foot plate construction for cloth cutting machines comprising a substantially rigid, carriage frame having a main body portion, and wings extending therefrom, said body portion being effective to mount and support the operating cutter mechanism of the machine, yieldable means carried by said wings, and wheels carried by said yieldable means whereby said construction is yieldingly supported for mobility, an inverted dished foot plate cover substantially enclosing said frame and having an opening through which the operating mechanism will extend, and yieldable means connecting said cover and frame, whereby to absorb vibration.

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