Oct. 5, 1937. J. H. DALE 2,095,172

CLOTH CUTTING MACHINE

Filed Oct. 15, 1935

Fig. 1.

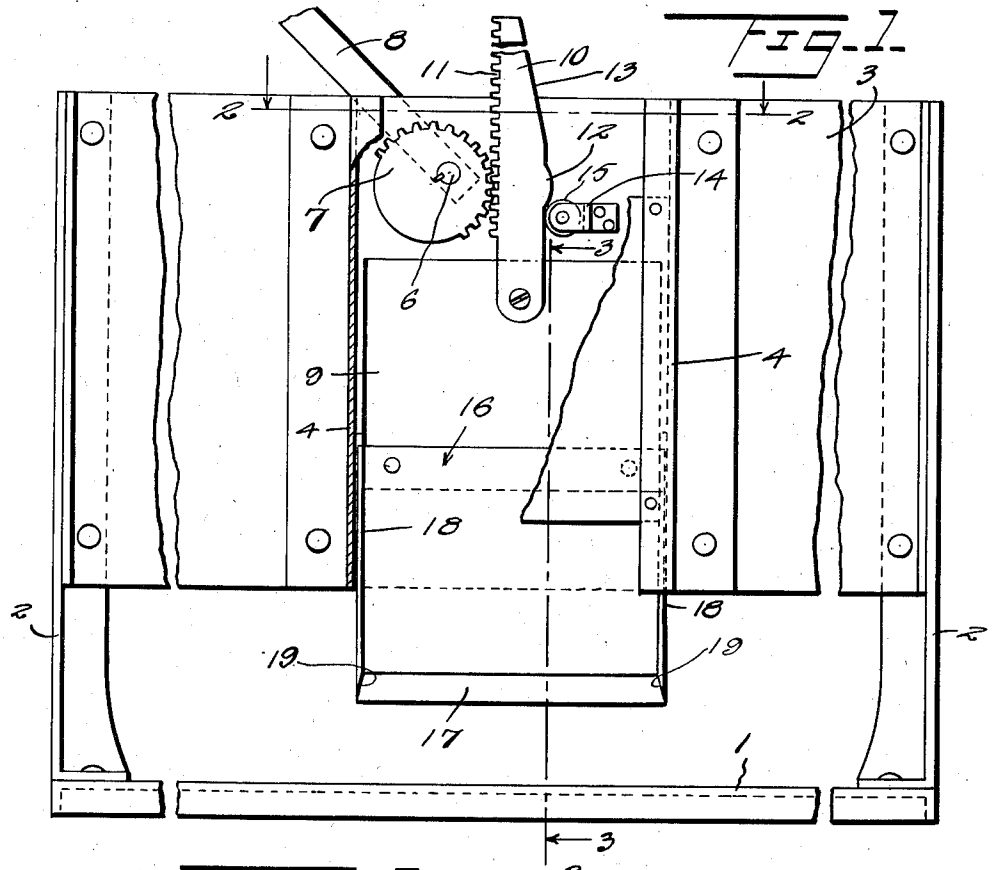


Fig. 3.

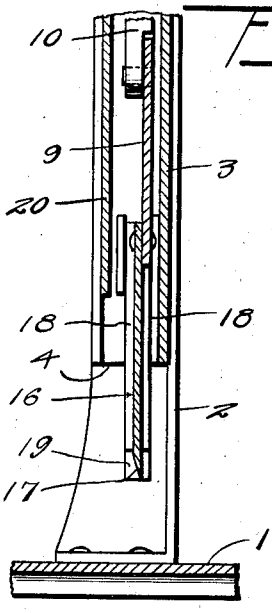
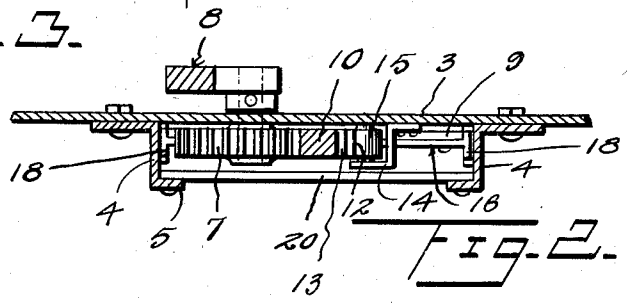


Fig. 2.



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CLOTH CUTTING MACHINE

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3 Claims. (Cl. 164—57)

This invention relates to the class of cutting devices for cloth and pertains particularly to a machine for forming slits in articles of clothing such as coats or the like.

The primary object of the present invention is to provide a machine for forming pocket or dart slits in pieces of cloth material in which a reciprocating knife is employed for cutting through a pile of cloth bodies and for simultaneously forming transverse slits at the ends of a main long slit in the bodies.

Another and important object of the invention is to provide a machine for the above described purpose which is so designed that varying degrees of pressure are automatically applied to the cutting knife so that the greatest pressure or force will be applied at the start of the cutting operation when the cloth bodies are first compressed, and the force will be gradually lessened as the knife moves through the bodies so that an even and smooth cutting action will be obtained.

Another object of the invention is to provide a cloth cutting machine of the character described wherein a knife is employed having a cutting edge extending at right angles to its path of movement whereby an even downward pressure will be applied to the cloth and the same will not tend to shift laterally under the knife as is the case in machines of the type at present in use where a knife blade having an oblique cutting edge is employed.

Still another object of the invention is to provide a knife blade of novel construction in which transverse cutting edges are formed at the ends of the main cutting edge of the blade whereby transverse slits are formed in the cloth at the ends of the main slit simultaneously with the formation of the latter.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawing:

Figure 1 is a view partly in elevation and partly in section of the machine embodying the present invention.

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1.

Referring now more particularly to the drawing wherein like numerals of reference indicate corresponding parts throughout the several views, the numeral 1 indicates a base and cutting board for the present machine, which is formed of some relatively soft metal against which a steel blade may press without being damaged, or which may be formed of wood if found desirable. At each end of this board 1 is an upright or standard 2 and between the standards is secured a plate 3 upon which the operating parts of the machine are mounted.

Extending vertically across the plate 3 in spaced relation are two substantially Z-shaped guides each of which is indicated by the numeral 4, and these guides have flanges 5 which are in opposed relation and which are spaced from the plate 3, as illustrated in Fig. 2.

Extending through the plate 3 adjacent the top edge thereof and between the guides 4, is a shaft 6 which is disposed at one side of the center of the area between the guides 4 and which has mounted eccentrically thereon the gear wheel 7. Upon the back of the plate 3 there is secured to the shaft 6 a lever 8 which when oscillated, effects the eccentric rotation of the gear wheel 7, as will be apparent from Fig. 1.

Disposed between the guides 4 is a reciprocating knife holder plate 9 which has pivotally attached thereto adjacent its top edge the rack bar 10, along one side edge of which are formed teeth 11 which are constantly in mesh with the teeth of the gear 7. The opposite side of the rack 10 has a cam point 12 formed thereon and between this point and the top or free end of the rack the back edge tapers toward the toothed edge, as indicated at 13.

Secured to the plate 3 upon the side of the rack 10 opposite the gear wheel 7 is a bracket 14 which carries a roller 15 which is in constant contact with the back edge of the rack in the manner illustrated.

The knife holder plate 9 is detachably secured to a knife 16. This knife is of a width equal to the distance between the guides 4 and the transverse cutting edge 17 thereof is perpendicular to the vertical path of movement of the knife. At each vertical edge the knife plate 16 has the oppositely directed flanges 18 which at their lower ends taper off so as to form the sharpened bottom edges 19, which extend transversely to the main cutting edge 17 of the knife and thus form in a body of cloth against

which the edge 17 will be pressed, a long slit which has short transverse slits at each end.

In order to protect the moving parts of the machine, a cover plate 20 is secured between the opposed flanges 5 of the guides 4, as illustrated in Fig. 2.

In the use of the present machine, a number of pieces of cloth are disposed in a pile upon the plate or board 1 beneath the knife 17. The knife is then forced downwardly through the cloth pieces or plies by the actuation of the lever 8. Due to the eccentric positioning of the gear 7, it will be apparent that when starting from the position in which it is shown in Fig. 1, a strong leverage will be obtained for effecting the initial movement of the blade edge 17 against the pile of fabric pieces and into the same.

As the gear continues in its eccentric rotation the distance between the rotating center and the rack 10 will be gradually increased so that as the knife edge nears the bottom of the pile of cloth pieces the effort for it to cut through the pieces will be lessened and a more rapid movement of the knife will be permitted and will take place. The cam point 12 upon the rack serves by its passage past the roller 15, to hold the rack in mesh with the gear 7 as the gear passes the line where the distance between its center and the rack is shortest. Then as the gear continues to rotate eccentrically and the rack continues to move downwardly the inclined surface 13 will allow for the lateral swinging of the rack as the distance increases between the rotating center of the gear and the toothed face of the rack. As previously stated, as this distance increases the rapidity of downward movement of the rack will also increase, but the leverage will be decreased.

From the foregoing it will be apparent that with the mechanism here described, the changes in power required between the starting movement of the knife through a pile of cloth and the finishing movement of the knife as it reaches the bottom of the pile, do not have to be supplied by the muscular effort of the operator of the machine, but are taken care of by the eccentric mounting of the operating gear wheel. In addition, the present machine does not require the use of presser feet to hold the plies of cloth in proper position while the knife is cutting through the same because of the formation of the knife blade in line parallel with the cutting surface, by which construction an even downward pressure is applied to the cloth plies and there is no force operating thereon which would tend to shift them laterally on the cutting board.

What I claim is:

1. A cloth cutting machine comprising a cutting board, a knife mounted for vertical reciprocatory movement relative to the board, a rack connected with the upper part of said knife, a gear eccentrically mounted adjacent to and having toothed connection with the rack, lever means connected with the gear for effecting its eccentric rotation, said rack having pivotal connection with the knife structure, and means having constant engagement with the rack and normally maintaining its toothed connection with the gear but permitting oscillatory movement of the rack.

2. A cloth cutting machine comprising a cutting board, a knife mounted for vertical reciprocatory movement relative to said board, guiding and supporting means for said knife, a rack pivotally attached at one end to the knife structure and extending vertically therefrom, said rack having teeth along one longitudinal edge, a cam point formed upon the opposite longitudinal edge of the rack, a camming surface upon said opposite longitudinal edge between said point and the free end of the rack, said last surface tapering toward the toothed edge of the rack, a roller element mounted upon said supporting means and having constant contact with the said opposite edge of the rack, a gear eccentrically rotatably mounted upon said supporting means and having toothed connection with the rack, and lever means for rotating said gear, said cam point and roller being in contact when the distance between the center of rotation of the gear and the rack is shortest.

3. In a cutting machine of the character described, a flat cutting surface, a knife having a transverse cutting edge, means supporting the knife for vertical reciprocation with said edge in parallel relation with and adapted to contact said surface, means integral with the knife at each end of the edge forming a short cutting edge perpendicular to the first edge and extending beyond the two sides thereof, the said transverse edges being in the same plane as the first edge to contact said surface therewith, and means for effecting reciprocation of the knife.

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