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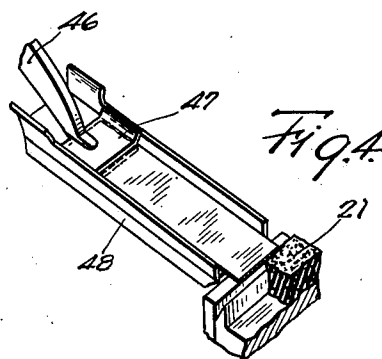
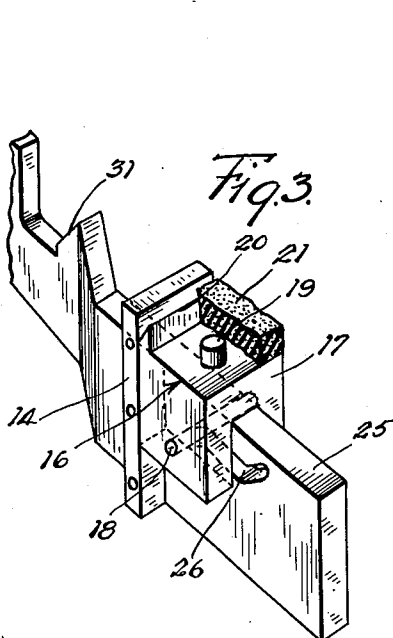
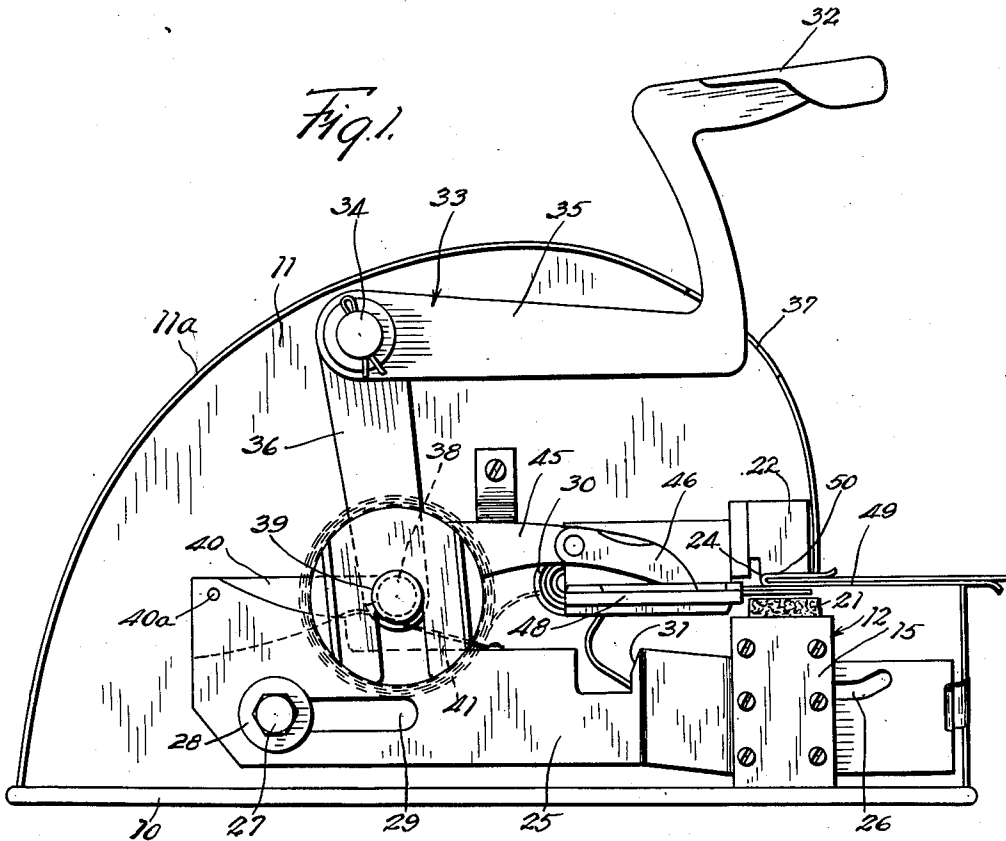
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2,512,822

REINFORCING AND PUNCHING MACHINE

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2 Sheets-Sheet 1



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REINFORCING AND PUNCHING MACHINE

2 Sheets-Sheet 2

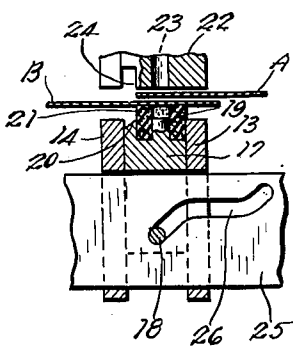


Fig. 5.

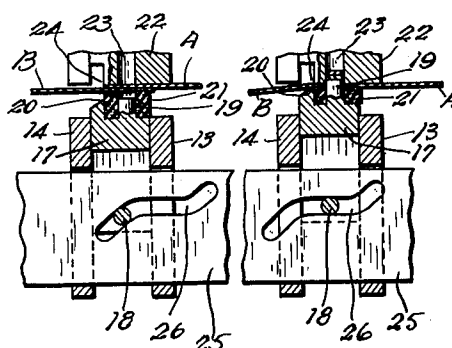


Fig. 6.

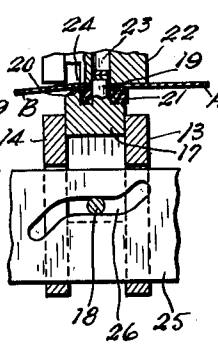


Fig. 7.

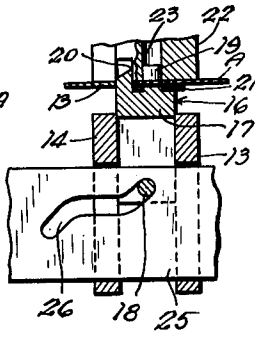


Fig. 8.

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UNITED STATES PATENT OFFICE

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REINFORCING AND PUNCHING MACHINE

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7 Claims. (Cl. 93—1)

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The present invention relates to a sheet reinforcing machine and has special reference to a combined sheet reinforcing and punching machine for applying pieces of reinforcing material to sheets adjacent the edges thereof and thereafter punching holes through both the sheet and the reinforcing material.

Sheets, such as those intended for use in the ordinary loose-leaf notebook, having perforations adjacent one side edge for receiving the posts, rings or other fastening devices of the loose-leaf covers are extensively used for innumerable purposes. However, they are subject to the disadvantage that the margins of the openings are quite weak and may be easily torn, resulting in unintentional removal of the sheets. While gummed eyelets have been secured about the openings of previously perforated sheets for the purpose of reinforcing the sides of the openings, this is a slow tedious process, involving first moistening the gummed side of the previously formed eyelet and thereafter manually securing it in place about the opening.

With a machine embodying the present invention, adhesive tape, such for example as the well-known cellulose or linen tapes, may be fed from a roll in a continuous strip of suitable width to the edge portion of the sheet to be reinforced and applied thereto. Thereafter, a hole is punched through both the sheet and the thereto-secured reinforcing material, and the rectangular piece of reinforcing material secured to the sheet is severed from the remainder of the strip along the edge of the sheet.

The whole operation may be quickly and easily performed with the present machine, it being only necessary to keep it supplied with suitable reinforcing material.

An object of the present invention is to provide a simple efficient machine for applying reinforcing material to sheets adjacent the edges thereof.

Another object is to provide a machine for applying reinforcing material to a sheet and punching out openings in the reinforced portion of the sheet.

Still another object is to provide a reinforcing and punching machine for feeding reinforcing material from a roll, securing it to a sheet and thereafter punching an opening in the reinforced portion of the sheet.

Further objects and advantages will be apparent from the following description and claims when considered together with the accompanying drawings, in which

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Fig. 1 is a side elevational view of a machine embodying the present invention with a side of the casing removed disclosing the position of the various elements at the beginning of a reinforcing and punching operation;

Fig. 2 is a view generally similar to Fig. 1 with the elements shown in their position at the end of an operation;

Fig. 3 is a perspective view of the punch and operating slide bar therefor;

Fig. 4 is a perspective view of the mechanism for feeding and guiding the tape from the roll to the punch and die;

Figs. 5, 6, 7 and 8 are side elevational views, partially in cross-section, of the punch and die mechanisms and associated parts in various positions during the progressive operation of the machine.

Referring to the drawings, and more particularly to Figs. 1 and 2 thereof, there is shown a reinforcing and punching machine embodying the present invention. This machine may comprise a base 10 having a supporting wall 11 at one side. A cover 11a encloses the device. Extending upwardly from the base 10 is a substantially rectangular guide 12 comprising a portion of the wall 11, two oppositely disposed side members 13 and 14 and the plate 15 connected to the two side members 13 and 14. Mounted for reciprocation in the guide 12 is a punch member 16 which comprises a plunger 17 substantially in the shape of an inverted "U" in cross section having a pin 18 extending between the two opposed sides thereof. The top of the plunger 17 has a centrally positioned upwardly extending punch 19 and at the inner side thereof a cutting or knife edge 20. Arranged about the punch 19 is a pad 21 of resilient, compressible material such as sponge rubber which normally extends upwardly above the top of the punch as shown in Fig. 5, there being an opening in the material above the punch to permit it to pass therethrough. The knife edge 20 is slightly below the cutting edge of the punch 19.

Positioned above for cooperation with the punch member 16 is a die member 22 having a central opening 23 for receiving therein the punch 19 when the two members are brought together. The lower face of the die 22 about the opening 19 is flat and cooperates with the upper face of the resilient pad 21 to clamp a sheet and a portion of the reinforcing material therebetween. At the inner side of the lower face of the die member 22 is a cutting edge 24 positioned to cooperate with the cutting edge 20.

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While the punch, the die member, or both, may be made movable, in the preferred embodiment, the punch member is vertically reciprocated while the die member remains stationary. Reciprocation of the punch member is caused by movement of the horizontally movable slide bar 25 having a slot 26 therein. The plunger 17 straddles the bar 25 with the pin 18 positioned in the slot 26. The slot has a relatively long horizontal central portion terminating at the left or inner end in a downwardly sloping portion and at the right or outer end in an upwardly sloping portion as appears particularly in Figs. 5 through 8.

When the slide bar 25 is moved toward the right as shown in Figs. 5 through 8, the pin 18 will ride downwardly into the lower end of the slot 26 thereby moving plunger 17 to its lowermost position, illustrated in Figs. 1 and 5. In this position, the upper face of the resilient material 21 is spaced a little below the lower face of the die member 22 to permit a sheet A and a portion of the reinforcing material B to be placed therebetween. Initial movement of the slide bar to the left raises the plunger 17 to clamp the sheet and reinforcing material between the die and punch members, with the punch still spaced from the die as shown in Fig. 6. As the slide bar is moved further to the left, the plunger 17 is raised and the punch 19 co-operates with the die cutting edge to perforate the sheet and reinforcing material. By this time, the pin 18 is riding in the central horizontal portion of the slot 26 as illustrated in Fig. 7. Still further movement of the slide bar 25 to the left results in the pin riding upwardly in the upper right-hand portion of the slot, with the cutting edge 20 co-operating with the cutting edge 24 to sever the reinforcing material B along the edge of the sheet A (Fig. 8).

One end of the slide bar 25 is guided by the opposed sides of the plunger 17 and the opposite end is guided by the bolt and washer 27 and 28 respectively, the bolt passing through a slot 29 in the slide bar 25 and being secured to the wall 11.

A coil spring 30 having its end positioned in the recess 31 formed in the slide 25, normally maintains the slide 25 toward the right with the plunger 17 in its lowermost position.

Operation of the machine is provided by the handle 32 formed on the outer end of the bell crank 33 pivotally mounted on a stud shaft 34 at the apex of arms 35 and 36. The shaft 34 extends outwardly from the wall 11. With this construction, depression of the handle 32, which projects through the slot 37 in the casing 11a, moves the lower end of the arm 36 rearwardly of to the left as shown in Figs. 1 and 2. Extending from the lower end of the arm 36, toward wall 11, is a roller 38 which normally engages the end 39 of a dog 40 pivotally mounted at 40a adjacent the rear end of the slide bar 25. The dog 40 is normally held in its upper position, illustrated in Fig. 1, by a leaf spring 41. When the handle 32 is depressed, the arm 36 is moved rearwardly and the roller 38 engaging the end 39 of the dog 40 causes rearward movement of the slide bar 25. This continues until the roller 38 rides up with respect to the dog 40 to the position shown in Fig. 2 at which point the roller forces the dog downwardly against the action of the leaf spring 41 and the coil spring 30 snaps the slide bar to the front or right positions as viewed in the drawings.

Also mounted on the lower end of the bell crank arm 36 but extending in the opposite direction

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from roller 38, is a stud shaft 42 for rotatably receiving a hub 43 on which is placed a roll of adhesive tape 44 to permit rotation of the roll about the shaft. The roller is arranged as shown in Figs. 1 and 2 so that the end thereof is separated therefrom at the bottom and is directed to the punch and die members by suitable guide means with the adhesive side uppermost.

The adhesive tape guide preferably consists of a fixed guide and a pusher which comprises an arm 45 secured to the lower end of the bell crank arm 36 with a pivoted end portion 46, provided with a pusher 47. The fixed guide 48 directs the tape to proper position just above the resilient material of the punch member 16.

There is also provided a sheet supporting table 49 having U-shaped inner ends 50 at opposite sides of the punch and die members for properly positioning a sheet to be treated between said members just above the reinforcing material.

To prepare the machine for use a sheet of paper or other material A is first inserted between the punch and die members, being properly positioned by the support 49 and positioning members 50. The end of the reinforcing tape 44 is pulled from the roll and threaded through the guide 48 below the pusher 47 with the end thereof extending to the front end of the punch and die members as illustrated in Fig. 5.

In operating the device the handle is depressed moving the slide 25 toward the rear. This in turn causes the pin 18 to ride upwardly in the slot 26 and raises the punch member to clamp the sheet and reinforcing material together between the resilient material 21 and the lower face of the guide member 22. Thereafter, as the slide bar 25 is moved further to the rear, the adhesive tape holder 42 is moved rearwardly and unwinds an additional portion of the tape from the roll, at the same time the plunger 17 moves upwardly to the position shown in Fig. 7 resulting in perforating of the sheet and reinforcing material.

Further movement of the slide continues to unroll the tape until the pin 18 rides up to the upper portion of the slot 26 when the knife 20 co-operates with the cutting edge 24 and severs the tape along the edge of the sheet. At this point, the dog 40 is depressed and the slide 25 is returned to its original position by the spring 30, thereby separating the punch and die members. Raising of the handle 32 moves the bell crank arm 36 with the tape and pusher 47 toward the front of the machine, feeding the end of the tape between the punch and die members ready for further operation.

The reinforcing and punching machine hereinbefore described is particularly suitable when adhesive tape in roll form is used as reinforcing material which, due to the tackiness of the material, resists unrolling. However, other forms of reinforcing material may be used, such as gummed tape which requires moistening to make it tacky. When this later type of tape is employed, moistening means may be applied. If desired, a plurality of similar units may be arranged to operate simultaneously to reinforce and punch any number of desired openings. The machine may also be used for the purpose of merely applying reinforcing material, in which case clamping members having flat opposed surfaces would be substituted for the punch and die members.

While I have shown and described a particular embodiment of the present invention, it is to be understood that various changes may be made

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therein without departing from the invention, and therefore I wish to be limited only by the prior art and the appended claims.

I claim:

1. In a machine for applying reinforcing adhesive tape to a sheet, upper and lower clamping members relatively movable toward and away from each other for receiving and clamping a sheet and a portion of adhesive tape therebetween, means for positioning a sheet therebetween, a movable holder for rotatably supporting a roll of adhesive tape, means for guiding said tape from said roll to said clamping members with the adhesive side facing a sheet positioned therebetween, means for moving said holder away from said clamping members when they are in clamping relationship to unroll a portion of said tape and for returning said holder to original position when said clamping members are separated, and cutting means acting to cut said tape along the edge of a positioned sheet when said holder is substantially a maximum distance away from said clamping members.

2. In a device of the character described a punch member and a co-operating die member movable relatively towards and away from each other for receiving and clamping a sheet and a web of reinforcing material therebetween and punching a hole therein, a holder for said web of reinforcing material movable toward and away from said punch and die, and means acting to move said holder away from said punch and die when the latter are in clamping relationship and to return said holder to original position when said punch and die are separated.

3. In a device of the character described, a punch member and a co-operating die member, said members being relatively movable toward and away from each other for receiving and clamping a sheet and a portion of reinforcing tape therebetween and punching a hole therethrough, a movable holder for rotatably supporting a roll of reinforcing tape, means for guiding the tape from said roll to said punch and die, and means for moving said holder away from said punch and die when they are in clamping relationship and returning said holder to original position when said punch and die are separated.

4. In a device of the character described, a punch member and a co-operating die member relatively movable toward and away from each other for receiving and clamping a sheet and a portion of reinforcing tape therebetween and punching a hole therethrough, sheet positioning means, a movable holder for rotatably supporting a roll of reinforcing tape, means for guiding said tape from said roll to said punch and die members, means for moving said holder away from said members when they are in clamping relationship and for returning said holder to original position when said clamping members are separated, and cutting means acting to cut said tape along the edge of a positioned sheet when said holder is substantially a maximum distance away from said members.

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5. In a device of the character described, a punch member mounted for reciprocatory movement, a die member mounted adjacent thereto for cooperation therewith, a movable holder for rotatably supporting a roll of reinforcing tape intended to be fed to said members, said punch member having a punch, a resilient clamping portion extending outwardly of said punch, and a cutting edge inwardly of said punch for co-operating with said die member to clamp together and perforate said sheet and tape and sever said tape, mechanism for causing reciprocation of said punch member, and means for moving said holder away from said members and actuating said mechanism to move said punch member toward said die until said tape is severed.

6. In a device of the character described, a punch member mounted for reciprocatory movement, a die member mounted adjacent thereto for co-operation therewith, means for positioning a sheet between said members, a movable holder for rotatably supporting a roll of reinforcing tape intended to be fed to said members, said punch member having a punch, a resilient clamping portion extending outwardly of said punch and a cutting edge inwardly of said punch for co-operating with said die member to clamp together and perforate said sheet and tape and sever said tape, a substantially horizontally movable bar having a slot therein co-operating with a portion of said punch member and shaped to cause reciprocation of said member when said bar is moved, and means for moving said holder away from said members and moving said bar in a direction to force said punch member toward said die until said tape is severed.

7. In a device of the character described, a punch member mounted for vertical movement, a die member above said punch member for co-operation therewith, means for positioning a sheet between said members, a pivotally mounted depending lever having thereon a holder for rotatably supporting a roll of reinforcing tape, said punch member including a punch, a resilient clamping portion for engaging said die before said punch and a cutting edge below said punch for co-operating with said die to clamp together and perforate said sheet and tape and sever said tape, a horizontally movable member for reciprocating said punch member on movement thereof positioned to co-operate with said lever, and means for pivoting said lever to move said holder away from said members while moving said bar to raise said punch member against said die member.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,437,022	Fritzinger	Mar. 2, 1948
2,441,821	Kendall	May 18, 1948