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B. HIRSZSON ET AL

2,583,944

PUNCHING AND REINFORCING DEVICE

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Fig. 1.

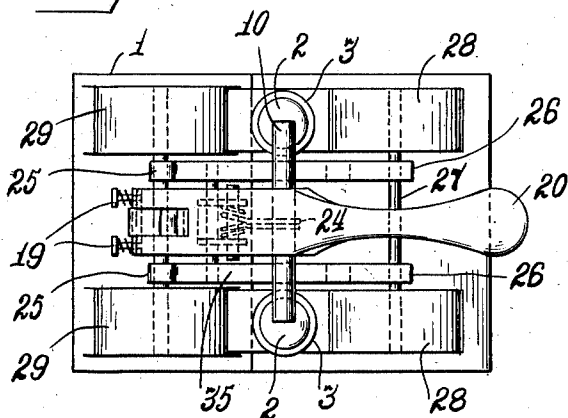


Fig. 2.

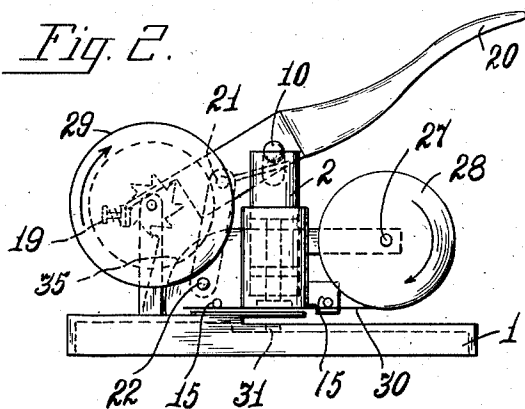


Fig. 3.

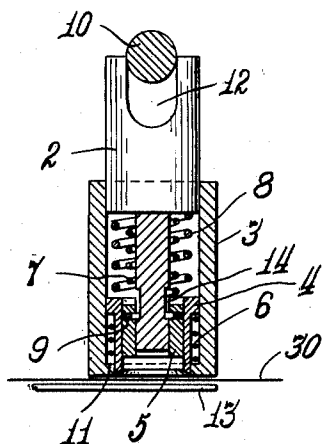


Fig. 5.

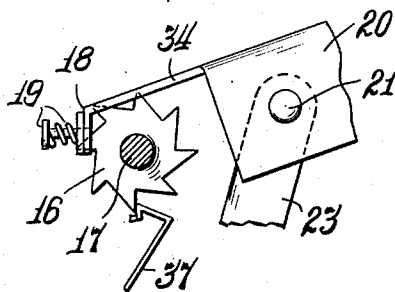
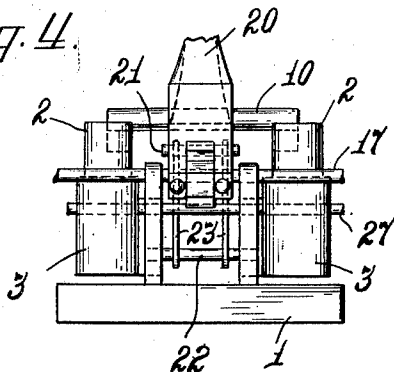


Fig. 4.



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UNITED STATES PATENT OFFICE

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PUNCHING AND REINFORCING DEVICE

Beniamin Hirszsos and Joseph Anthony
Paparelli, Rio de Janeiro, BrazilApplication December 20, 1947, Serial No. 792,924
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2 Claims. (Cl. 93—1)

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The purpose of the invention submitted is to apply a permanently adhesive material in the form of a reinforcing ring or surface of any shape to a sheet of paper or any other similar material. The applied reinforcing agent and sheet of paper or any other similar material are subsequently perforated, the result being a reinforced hole.

The device is supplied with rolls of the permanently adhesive reinforcing strips. The said strips are allowed to move under vertical cylinders containing the cutting, applying and perforating mechanism. The complete chain of action is imparted through a lever which coordinates the successive movements in predetermined sequence so that the advance of the said permanently adhesive reinforcing tape, the cutting, application and perforating are performed in one downward stroke of said lever. The said strip is received on a metering receiving roll after having been punched and the required rings or applying surfaces removed.

The application of the invention may be for the reinforcing of one, two or more holes simultaneously. The above mentioned system of reinforcing may be executed by a hand lever or electrically energized.

Figure 1 is a top view of the device. Figure 2 is a side elevational view of the same device. Figure 3 is an enlarged vertical section of the cutting, applying and perforating mechanism. Figure 4 is a rear view of the device with rolls omitted. Figure 5 is an enlarged side view of the slip gear and handle as they become disengaged.

On the base 1 are fixed by upstanding walls 35 bored cylinders 3 containing the three operational parts of the cutting, application, and perforating mechanism. Between the two vertical cylinders 3 fixed to the base 1, a handle 20 is journaled on a pin 21 carried on two bars 23 and 23 pivoted at their lower ends on a pin 22 extending between the columns 35. On the rear end of the handle 20, a movable latch 18 is supported by latch springs and pins 19.

On two rigid vertical bars 25 and 25, is fixed a shaft 17, on which the gear 16 is placed, being positioned directly below a slot 34 in the handle 20, so that the latch 18, with the handle 20 in its normal elevated position, engages the said gear 16.

A spring 24 on the upper pivot pin 21 keeps the handle 20 in an elevated normal position. Within the cylinders 3 are the two cylindrical cutters 4 supported by springs 6, which rest on the shoulders 11 in the lower part of the cylinders 3.

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Sliding in the cutters 4, the appliers 5 are held downward by springs 7 against the lower parts of slots 14 with the retaining rings 9. The perforating plungers 2 are held in elevated position by springs 8. Springs 8 have greater compression strength than springs 6.

Protruding forward from the supporting walls 35 for the cylinders 3, are two horizontal bars 26. Through bars 26 is shaft 27 on which are fixed the supplying rolls 28 of tape 30.

Unwinding the tape 30 leaving the supplying rolls passes under two position rollers 15 and between the lower ends of cylinders 3 and cutting plates 13. The tape 30 is then wound on metering receiving rolls 29 attached to and rotatable with the shaft 17.

The action is begun and completed by one downward motion of the handle 20. As the handle 20 begins its downward motion, the latch 18, which in a normal position has engaged a tooth on the gear 16, rotates the gear in a clockwise direction. The metering receiving rolls 29 attached to the same shaft 17 as the gear 16, are also rotated in the same direction causing the tape to be wound on it.

The tape 30 is unwound from the supplying rolls 28, passing under the positioning rollers 15 and between the cylinders 3 and the cutting plates 13, to the metering receiving rolls 29. A constant pressure is maintained on the tape 30 by pressure retaining spring 37 which is attached to the base 1 and engages over the gear teeth to prevent backlash. This also permits the handle 20 to return to its normal position without the metering receiving rolls 29 moving counterclockwise.

As the handle 20 continues its downward motion there approaches the point where the latch 18 commences to move away from the gear 16 and finally completely disengages, leaving the next tooth on gear 16 in a position to be engaged with the latch 18 as the handle 20 returns to its normal position after full execution of the reinforcing perforation operation.

During the above mentioned period when the handle 20 is operating the gear 16 for purposes of feeding the tape 30, the handle pin 10 is allowed to move freely in plunger slots 12 without giving any motion to plungers 2.

The gear mechanism is so constructed that as the pin 10 reaches the bottom of the slots 12, the latch 18 is disengaged from the gear 16 and the tape 30 has been moved in to position ready to be cut and applied.

Continuing on the same downward motion, the plungers 2 under force of pin 10 are pushed

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down. Through springs 8 this motion is relayed to cutters 4 which are held up by springs 6.

Since springs 8 are of greater compression strength than springs 6, the cutters descend with the plunger. Descending the cutters 4 encounter the tape 30 and press it against and through the cutting plates 13 and cut the required reinforcing rings or surfaces of any other shape.

The reinforcing rings or surfaces of any other shape are then in a position ready for the action of the appliers 5, since the cutters 4 have been stopped by the shoulders 11 in the cylinders 3, after having cut. The cutters 4 having stopped, make possible the continued downward movement of the plungers 2 to which the appliers 5 are attached.

The appliers 5 are slightly ahead of the plungers 2 so that they first encounter the reinforcing rings in the cutters 4. The appliers 5, continuing downward press the reinforcing surfaces against the sheet of paper or any other similar material, inserted beneath the cutting plates 13 then stop their downward motion and the plungers 2 continue downward.

The applier springs 7 are always kept under tension in the downward motion by the retaining rings 9 at the same time allowing the movement of the plungers 2 to continue on to perforate the applied reinforcing rings or other surfaces of any shape, on a sheet of paper or any other similar material.

The actual construction of the device may be varied within the scope of the invention, that is to say that should the invention apply to anything other than paper or to any other reinforcing material other than permanently adhesive tape, or should the device be operated manually or otherwise or should the device be so arranged that only one roll of the permanently adhesive material be used to feed two or more of the cutting, applying and perforating cylinders instead of a separate roll for each cylinder, it would still conform with the basic idea as explained.

Having explained the essential principles of the device, we claim:

1. In a machine of the character described

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including selectively actuatable mechanism to impart incremental rotation to a rewind spool, said means including an actuating lever forked at one end movable in an arc, a shaft carrying said spool, a gear secured on said shaft, a dog carried by said lever and bridging at the fork engageable with the gear when the lever is moved in one direction to rotate the shaft a predetermined distance, and a spring finger associated with said gear to prevent backlash of the shaft.

2. In a device for severing and attaching a reinforcing piece to a sheet and perforating the attached piece and sheet, a cylindrical body, a cutting ring in said body, a spring normally holding the cutting ring in an elevated position, a plunger slidable in the body and through the cutting ring, a spring normally holding the plunger elevated and affording a compressible connection between the cutting ring and plunger whereby initial downward movement of the plunger carries the cutting ring downwardly to sever the piece from a supply strip, and an attaching ring telescoped on and resiliently connected to the plunger within the cutting ring, said attaching ring engaging the severing piece and pressing it against the sheet prior to perforating descent of the plunger.

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