March 10, 1942. C. L. HALMRAST 2,275,525

COMBINATION PUNCH FOR NON-METALLIC WASHERS

Filed Oct. 21, 1940

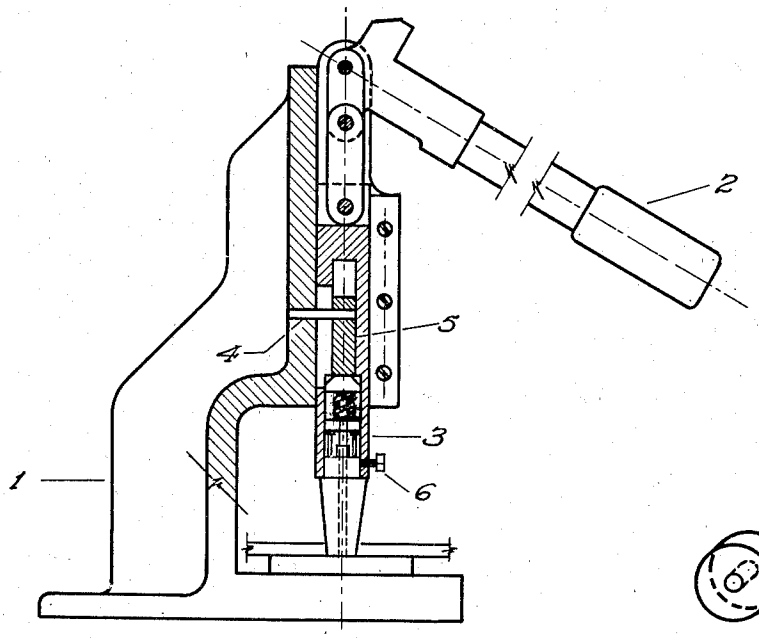


Fig. 1

Fig. 5

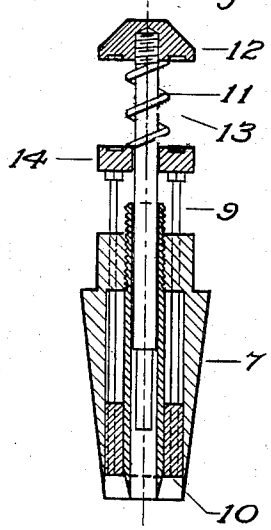


Fig. 2

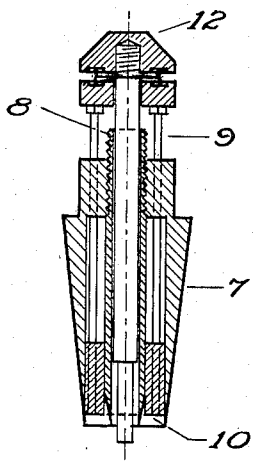


Fig. 3

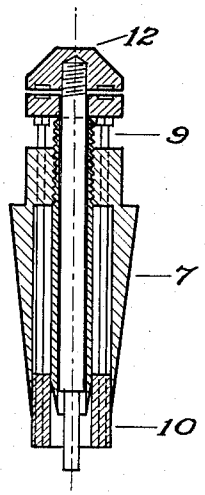


Fig. 4

Inventor

Carl L. Halmrast

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COMBINATION PUNCH FOR NONMETALLIC WASHERS

Carl L. Halmrast, Vancouver, British Columbia, Canada

Application October 21, 1940, Serial No. 362,096

4 Claims. (Cl. 164—33)

My invention relates to improvements in a combination punch for cutting washers out of strips of non-metallic materials, and the object of my improvements are, first, to facilitate cutting said washers rapidly with a spontaneous stripping action ejecting washers clear of said punch; second, to render the punch simple in construction with the several parts readily accessible for inspection or repair; and third, to adapt the machine to better perform the functions required of it.

I attain these objects by the mechanism illustrated in the accompanying drawing, in which:

Figure 1 shows a side elevation of a hand press with the improved combination punch set in position; Fig. 2 shows a sectional elevation of the improved combination punch in the cutting position; Fig. 3 shows a sectional elevation of improved combination punch in first position of ejecting action; Fig. 4 shows a sectional elevation of improved combination punch in final position of ejecting action; Fig. 5 shows an isometric view of resulting washer.

Similar numerals refer to similar parts throughout the several views.

1 represents a hand press frame provided with a handle 2, which, by means of levers, raises and lowers sliding head 3. A slot is provided in sliding head 3 to allow clearance for fixed pin 4. Fixed pin 4 extends through stop rod 5. A set screw 6 holds main cutting portion 7 rigidly.

Center hole cutting portion 8 is screwed centrally into upper part of main cutting portion 7. Three main ejector guides 9, threaded into main ejector barrel 10, allow same to travel a limited distance up or down. Center hole ejector 11 is threaded into cap 12. A coil spring 13 is wound around center hole ejector 11, and sits in a groove provided in under part of cap 12, and in a groove provided in collar 14, which rides on heads of main ejector guides 9.

The operation of the punch is as follows:

When handle 2 is brought to the down position the punch parts will be positioned as in Fig. 2. Main cutting portion 7 and center hole cutting portion 8 sever the material. The washer produced clings to punch. On the upward stroke Fig. 3, cap 12 contacts stop rod 5, which compresses coil spring 13. At the same time center hole ejector 11 travels downward and protrudes beyond center hole cutting portion 8, and forces out clinging waste in center hole. As the handle 2 advances further upwards Fig. 4, more pressure is exerted on cap 12, by stop rod 5. Cap 12 compressing coil spring 13, presses on collar 14, which forces down main ejector guides 9, which are attached to the main ejector barrel 10, which travels down and protrudes beyond main cutting portion 7, thus forcing out washer as shown in Fig. 5. On down-stroke return, the pressure on the spring 13 is released allowing the spring to expand and raise ejector 11 while the parts 10, 9 and 14 are raised by the material being cut when the cutter 7 starts its cutting action.

I claim:

1. A punch of the character described comprising a slidable head, a cutter secured to the lower end of said head, a second cutter coaxial with said first cutter and connected thereto, a center ejector member, a second ejector member between said cutters, and means between said ejector members for successively operating the same upon reciprocation of said head.

2. A punch of the character described comprising a slidable head, a cutter secured to the lower end of said head, a second cutter coaxial with said first cutter and connected thereto, a center ejector member, a second ejector member between said cutters, a stop above the upper end of said center ejector member adapted to depress said member upon upward movement of said head, and means between the upper end of said central ejector member and said second ejector member for depressing said second ejector member subsequent to the operation of the central ejector member.

3. A punch of the character described comprising a slidable head, a cutter secured to the lower end of said head, a second cutter coaxial with said first cutter and connected thereto, a center ejector member, a second ejector member between said cutters, a stop above the upper end of said center ejector member adapted to depress said member upon upward movement of said head, and a compressible spring between the upper end of said center ejector member and said second ejector member for actuating the latter member.

4. A punch of the character described comprising a slidable head, a cutter secured to the lower end of said head, a second cutter coaxial with said first cutter and connected thereto, a center ejector member having a head at its upper end, a stop above the head of said center ejector adapted to depress the same upon upward movement of said slidable head, a second ejector member slidably mounted between said cutters, guide rods extending upwardly from said second ejector member, a collar connected to said guide rods and slidable on said center ejector member, and an expansible spring mounted on said center ejector member between the head thereof and said collar.

CARL L. HALMRAST.