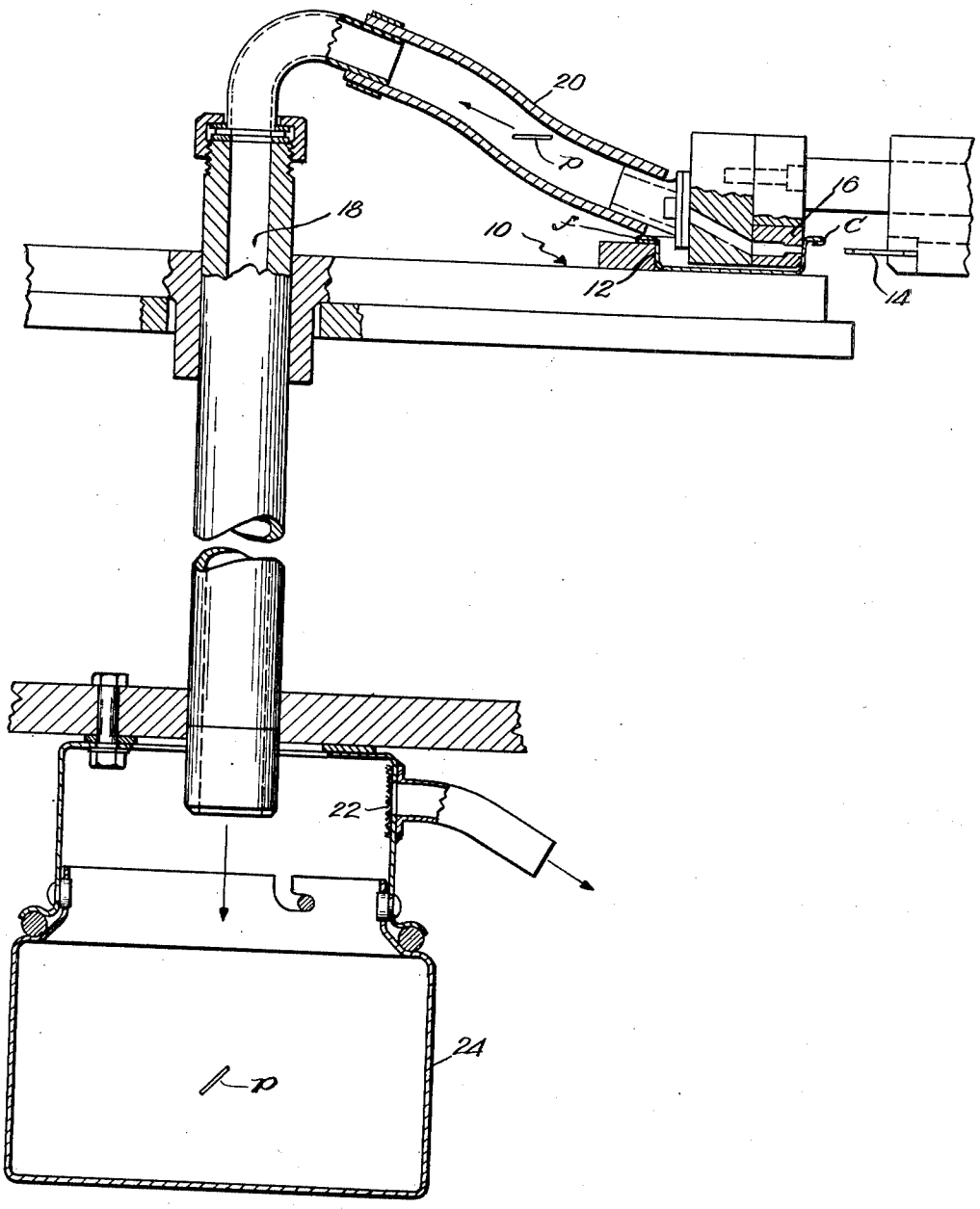
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PUNCHING MACHINE WITH PROVISION FOR REMOVING THE PUNCHINGS

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PUNCHING MACHINE WITH PROVISION FOR REMOVING THE PUNCHINGS

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3 Claims. (Cl. 164—87)

This invention relates to a machine for punching a slot in sheet metal work pieces, exemplified for the purpose of the present disclosure by a machine wherein a cup-shaped sheet metal stamping used as a closure for a friction top can is slotted through one of the walls of the cup to provide for the assembly of an opener lever therewith. This assembly may be effected in the same machine by means not necessary here to disclose. Such a machine is disclosed in the patent to Whelan No. 2,627,104, dated February 3, 1953, to which reference may be had. The object is to provide an improved mechanism for removing by suction the punching or strip of metal thus detached from the work, both to prevent it from becoming involved with parts of the machine with possible damage thereto or interference with a subsequent operation and to provide for its convenient disposition in a single place.

The invention will be well understood by reference to the following description taken in connection with the accompanying drawing showing a side view of the machine with parts broken away.

The invention as disclosed in the drawings is applied to a machine as disclosed in the Whelan patent above referred to, but there is herein shown only so much of that machine as is necessary for an understanding of the means for disposing of the punchings. As seen in the drawings it may comprise a conveyor or turret **10** having along its periphery pockets **12** which receive the individual closures. The turret is rotated intermittently and at one point the closure carried thereby is brought to rest opposite a punch **14**. By suitable means as fully disclosed in said Whelan patent a cooperating female die **16** is at the proper time lowered into the cup C and the punch **14** is actuated to cut from the wall *f* of the cup the punching *p* to drive it into or through the female die and the die then withdrawn before the cup C moves on to the next operating station in the cycle of the machine. Obviously if this were all either the detached metal punching would be left in the closure or would be driven out into a closure at some subsequent operation of the punch.

To carry away the punchings and deliver them to a place from which they can be readily removed in mass an exhaust conduit **18** is organized as a portion of the rotary axis of the turret, the lower end of this conduit being in communication with a source of negative pressure not shown. When the mechanical construction is as shown by Whelan, the conduit may be formed by an axial passageway through the fixed shaft about which the turret is turned. In practice it is found that a fan having about the capacity of a common household vacuum cleaner is satisfactory. From the upper end of this conduit a tubular extension **20** leads to a point adjacent the female die **16** to receive the punchings driven therethrough. As shown this extension is connected directly to the back of the die and is flexible to accommodate the

movement of the die incidental to its motion into and withdrawal from the cup. The punching thus is cut out and immediately thrust into the exhaust passage extension **20** and the transporting air is drawn through the die effectively to carry the punching along the extension **20** and down through the central exhaust passage **18** where it is intercepted by a screen **22** and drops to a place of collection, here shown as a removable can **24**.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claims to indicate those principles of the invention exemplified by the particular embodiment described and which I desire to secure by Letters Patent.

I claim:

1. In combination a rotary turret having on a face thereof adjacent the periphery holders for pieces of work, and punching means comprising a punch and die between which the pieces are positioned successively on rotation of the turret, said die having a through opening, the punch and the die when in operative position having their axes in a plane substantially parallel to the face of said turret, an exhaust conduit extending through the rotary axis of the turret, and a tubular connection connected to said conduit and extending to the back of the die opening, and suction creating means connected to said conduit through which connection the punchings are carried away.

2. In a machine for slotting the walls of cup-shaped pieces, a rotary turret having on a face thereof adjacent the periphery holders for such pieces, punching mechanism comprising a punch and die between which the pieces are positioned successively on rotation of the turret, means for actuating said parts to position the die at one side of the wall to be slotted and then to drive the punch in a plane substantially parallel to said face of the turret through the wall into the die, an exhaust conduit extending through the rotary axis of the turret, said conduit having connected thereto a flexible portion, which portion is connected to the back of the die opening, and suction creating means connected to said conduit to cause the punchings to be drawn therethrough.

3. In a machine for slotting the walls of cup-shaped pieces, a rotary turret having on a face thereof, adjacent the periphery, holders for such pieces, punching mechanism comprising a punch and die between which pieces are positioned successively on rotation of the turret with the punch and die when in operative position at opposite sides of said wall and having their axes in a plane substantially parallel to said face of the turret, a conduit for carrying away the punchings comprising a tube extending through the axis of said turret, said conduit having a flexible connection extending to the back of the die and having suction creating means attached thereto to cause the punchings to be drawn through said conduit.

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