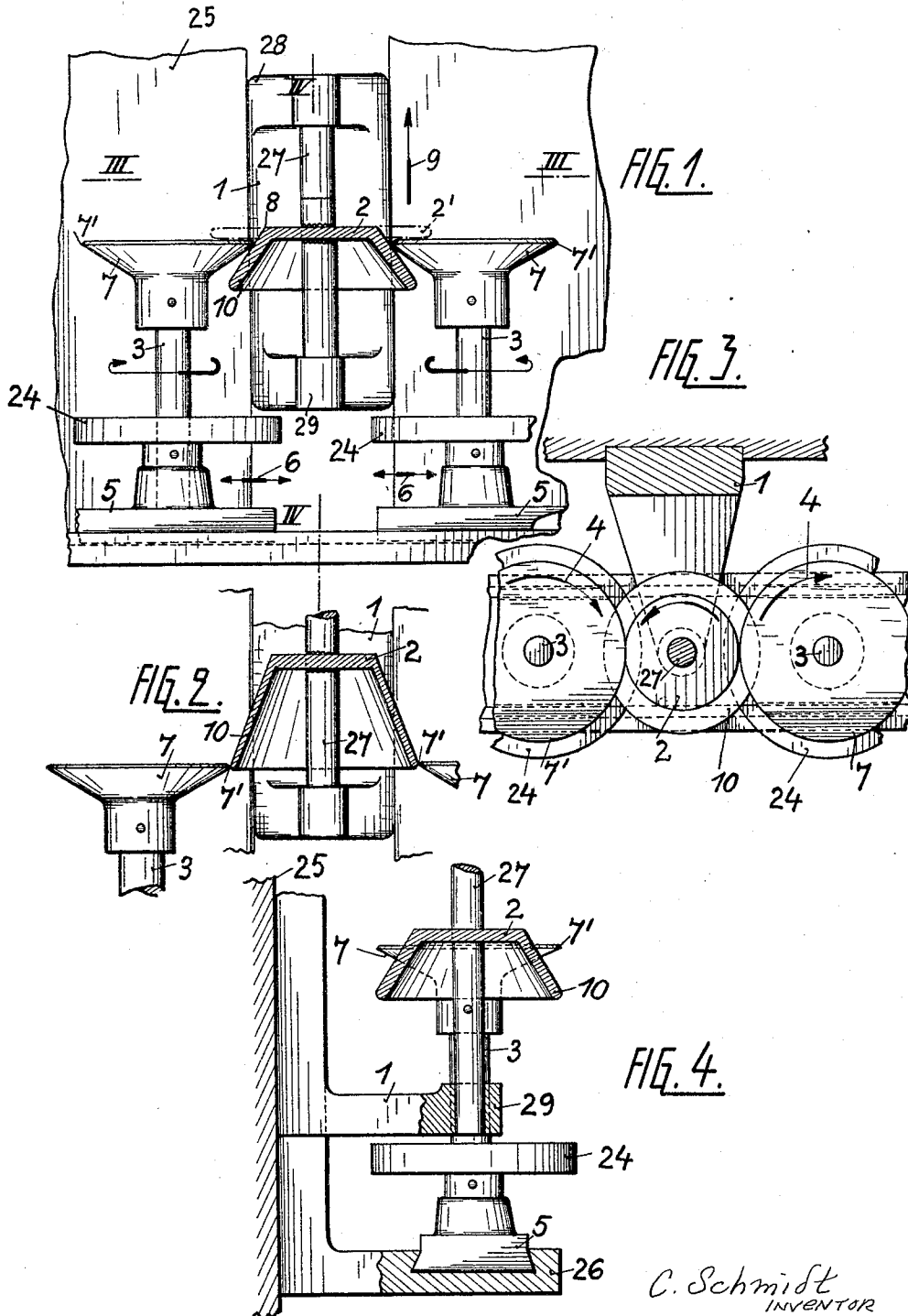


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MACHINE FOR MANUFACTURING HOLLOW ROTARY ELEMENTS
FROM CIRCULAR BLANKS OF SHEET METAL
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MACHINE FOR MANUFACTURING HOLLOW ROTARY ELEMENTS FROM CIRCULAR
BLANKS OF SHEET METAL

Original application filed June 27, 1927, Serial No. 201,850, and in Germany July 5, 1926. Divided and this application filed September 24, 1930. Serial No. 484,201.

My invention relates to a machine for manufacturing hollow rotary elements from circular blanks of sheet metal, merely by free outer rolling pressure, without any auxiliaries such as mandrels and the like.

This application is a divisional of my co-pending application 201,850 filed June 27, 1927.

To this end, I provide rotary means for holding a circular blank at its centre only, rotary rolling tools having edges adapted to rotate the blank by engaging its unsupported portion, means for rotating the tools, and means for effecting relative axial displacement of the tools and the blank.

In a preferred embodiment of my machine I provide a slide, which is adapted to be displaced, a shaft which is mounted to rotate on the slide and is adapted to hold the blank at its centre, and arrange my tools at opposite sides of the slide which are adapted to be displaced at right angles to the motion of the first-mentioned slide. These lateral slides support rolling tools which are rotated in the same direction. The axes of the rolling tools are parallel to the axis of the blank. I may also arrange the first-mentioned slide in a fixed position and so arrange to the two lateral slides with the rolling tools that they are displaced in parallel to the axis of the blank as well as at right angles thereto. The rolling operation is the same in both cases. The machine rolls the blank into a rotary hollow element without a mandrel, as will be described below.

It has already been proposed to roll shapes from sheet metal by means of rolls and a mandrel and to arrange the axes of the rolls and the mandrel parallel to each other, and to the axis of the shape but machines of this type are spinning and flanging machines in which the mandrel which I have eliminated, is indispensable. The mandrel also renders impracticable the manufacture of hollow shapes which are narrower at the top than at the bottom.

My machine has the advantage of extreme simplicity and reliability.

In the accompanying drawing a machine

embodying my invention is illustrated diagrammatically by way of example.

In the drawing

Fig. 1 is a partly sectional elevation of my machine showing the position of its parts in one of its initial stages.

Fig. 2 is a detail showing the blank and the spinning tools in the finishing stage.

Figs. 3 and 4 are a plan view and an elevation, respectively, in section on the lines III—III and IV—IV in Fig. 1.

Referring now to the drawing, 25 is a frame having a table or bed 26, 1 is a slide which is mounted to move vertically in a guide of the frame and may be actuated by any suitable means, not shown, 27 is a shaft mounted to rotate in bearings at the ends of the slide 1, and 2 is a blank the originally circular shape of which is indicated in dot-and-dash lines at 2' in Fig. 1. This blank is secured on the shaft 27 by any suitable chucking means, not shown, so that its central portion only is supported. 5, 5 are slides which are mounted in guides of the table or bed 26 and are adapted to be displaced horizontally with respect to the first slide 1 in opposite directions, each slide supporting a shaft 3 with a spur gear, a sprocket, a pulley or the like 24 by which the shaft is rotated, and a rolling tool 7 having a circular edge 7' which is preferably rounded. The shafts 3 are rotated in the same direction.

A flat circular blank 2' is chucked on the shaft 27 and the edges 7' of the tools 7 are arranged above the blank, about at 8, Fig. 1, at the beginning of the operation. The shafts 3 are now rotated as indicated by the arrows in Fig. 1 while at the same time the slides 5, 5 are moved in the direction of arrows 6, and the slide 1 is raised in the direction of arrow 9. Fig. 1 shows the beginning, and Fig. 2 shows the end of the cupping operation. In the present instance the cup is tapering to the outside, as shown at 10. If it is desired to obtain a cylinder the slides 5, 5 are not moved while the first slide 1 is raised. For a hollow element the diameter of which is smaller at the top than at the bottom the slides 5, 5 are moved toward each other while the first slide 1 is raised.

It will be understood that shapes of various kinds may be obtained by suitably determining the relative velocities at which the slide 1 and the slides 5, 5 are displaced. It is also possible to vary the direction and the velocity of the motion of the slides 5, 5 during the operation so that shapes of a great variety may be made.

I am not limited to two tools 7 but may provide any number of tools, but there must not be less than two. Nor am I limited to tools which are fixed in axial direction in combination with a movable slide but may provide the reversed arrangement of parts, as mentioned.

I claim:

1. A machine for spinning cups from circular blanks of sheet metal, comprising a slide, means on said slide for holding a blank at its centre only, so as to rotate freely, slides adapted to be displaced transversely with respect to said first-mentioned slide, a shaft on each of said last mentioned slides, and rolling tools on said shafts having edges adapted to shape the blank freely into a hollow shape.

2. A machine for spinning cups from circular blanks comprising a blank supporting slide including clamping members rotatable in the slide for clamping the respective sides of the central portion of a blank so as to leave the outer portion thereof free, reciprocating slides arranged on opposite sides of the first slide, shafts rotatably mounted in said latter slides and arranged in parallelism with the axis of the clamping members, means for rotating said shafts in the same direction, and tools carried by said shafts for engaging diametrically opposite sides of the free portion of the blank.

In testimony whereof I affix my signature.
CARL SCHMIDT.