

(No Model.)

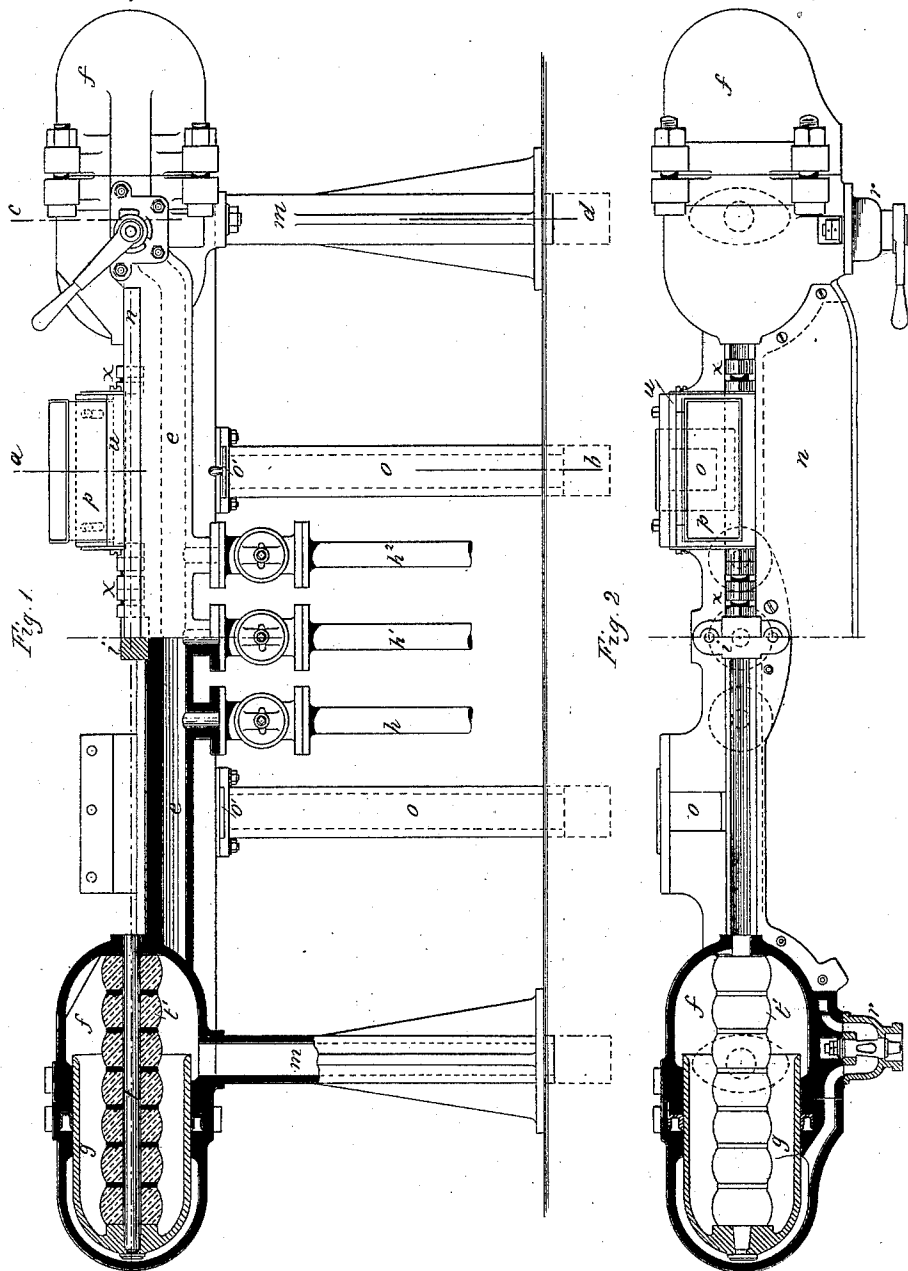
2 Sheets—Sheet 1.

G. PONZIO & D. ROBBIATI.

METHOD OF AND APPARATUS FOR THE MANUFACTURE OF BUTTONS
FROM HORN, &c.

No. 465,884.

Patented Dec. 29, 1891.



Witnesses:

E. L. Richards

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Fig. 3

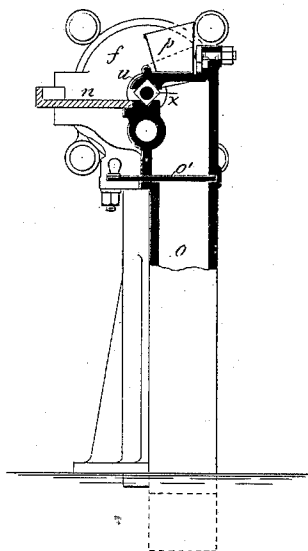


Fig. 4

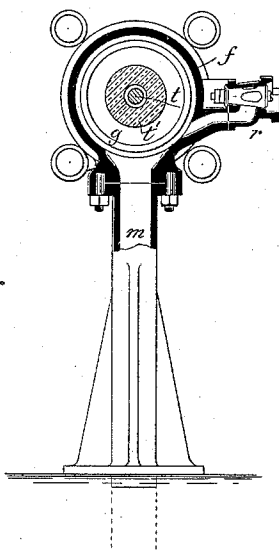


Fig. 6

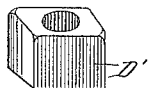
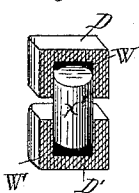


Fig. 5



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UNITED STATES PATENT OFFICE.

GIUSEPPE PONZIO AND DOMENICO ROBBIATI, OF MILAN, ITALY.

METHOD OF AND APPARATUS FOR THE MANUFACTURE OF BUTTONS FROM HORN, &c.

SPECIFICATION forming part of Letters Patent No. 465,884, dated December 29, 1891.

Application filed October 13, 1890. Serial No. 367,887. (No model.) Patented in Italy March 27, 1885, XXXV, 430, and December 27, 1887, XLIV, 379; in England August 26, 1885, No. 10,121, and November 25, 1887, No. 16,229; in Austria-Hungary November 24, 1885, No. 32,528 and No. 59,934, and April 7, 1888, No. 47,102; in France November 30, 1885, No. 170,837; in Germany February 8, 1886, No. 34,438, and July 12, 1888, No. 43,723; in Switzerland February 27, 1889, No. 658, and in Spain April 11, 1889, No. 9,286.

To all whom it may concern:

Be it known that we, GIUSEPPE PONZIO and DOMENICO ROBBIATI, subjects of the King of Italy, and both residents of Milan, Italy, have invented new and useful Methods of and Apparatus for the Manufacture of Buttons from Horn and other Equivalent Substances or Materials, (for which we have obtained patents in Italy on March 27, 1885, Vol. 35, No. 430, Reg. Att., and December 27, 1887, Vol. 44, No. 379, Reg. Att.; in France on November 30, 1885, No. 170,837, and February 15, 1888, No. 170,837, this latter being a patent of addition and bearing same number as the chief patent, dated November 30, 1885; in Germany on February 8, 1886, No. 34,438, and July 12, 1888, No. 43,723; in Austria-Hungary on November 24, 1885, Vol. 35, fol. 2,378, No. 32,528, and Vol. 19, fol. 2,337, No. 59,934, April 7, 1888, Vol. 38, fol. 893, No. 47,102, 887, and April 7, 1888, Vol. 22, fol. 948; in England on August 26, 1885, No. 10,121, and November 25, 1887, No. 16,229; in Spain on April 11, 1889, Liber 8, fol. 194, No. 9,286, and in Switzerland on February 27, 1889, No. 658,) of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to the method of and apparatus or machinery for the manufacture of buttons, while at the same time such molds are used as those generally employed in the manufacture of buttons by hand.

According to this invention there is arranged on the same axis a convenient or suitable number of pairs of molds, each pair containing two blanks or washers made of bone or other equivalent material capable of being pressed, and a bolt, the ends of which are intended to stamp the internal faces of the two blanks or washers. These couples or pairs of molds are placed one against the other, together making a column capable of moving along its axis by sliding in the inside of a suitably-arranged guide. At each end of the said column there are at least two molds which are not held by the guide. The column of molds is pressed between a fixed surface on

one side, and on the other side by a piston-rod or plunger from a hydraulic press, or by any other mechanical means capable of exerting the necessary pressure. After a suitable interval the pressure is removed, a couple of molds taken out at one end of the column, and the two stamped buttons contained therein are withdrawn. After this the column is advanced a distance corresponding with the height or length of the two molds, and another couple of molds previously heated containing the washers or blanks to be pressed are inserted at the other end of the column. The column of molds is subjected afresh to the pressing action, and the operation is continued, so that each pair of molds is gradually passed from one end of the column to the other, all being subjected to the same number of alternate periods of stamping and of advancing as there are pairs of molds in the column.

In order that this invention may be fully understood we will proceed to describe the same with reference to the accompanying drawings.

Figure 1 shows (half in vertical section and half in side elevation) a double machine constructed according to my invention. Fig. 2 is a view of the same machine, half being in plan and half in horizontal section. Fig. 3 is a vertical cross-section on the line *a b* of Fig. 1. Fig. 4 is a vertical cross-section on the line *c d* of Fig. 1. Fig. 5 shows in sectional elevation a pair of molds for containing the blanks, with bolt for stamping them therein. Fig. 6 is a perspective view of one of the molds.

h h' h², Fig. 1, are three tubes through which water under pressure is introduced to the body of the machine, each of such tubes being in communication with accumulators or other apparatus furnishing water at different pressures—say at one and one-half, three, and six atmospheres. The pressure in the body of the pump need not be varied except when the size of the buttons to be pressed is changed. For this reason the valves inserted in the tubes are so arranged as not to be worked by the attendant at the press, but controlled by

the foreman directing the making of the articles by means of cranks or hand-wheels. The tubes h h' h^2 open into a canal e , which conducts the water to the three-way cock r , which establishes connection between the press-cylinder f and outflow-pipe m or the feed-canal e . The canal e remains closed as soon as the outflow-pipe m and the cylinder f communicate. India-rubber springs t' are placed round the piston-rod t . These springs press the piston g toward the end of the press-cylinder when communication is established between the exhaust and the body of the said cylinder.

X X represent the column of matrices or molds which receive the horn disks that are to be pressed, there being a press-stamp X' , Fig. 5, between every pair of the said matrices D D', Figs. 5 and 6.

W W', Fig. 5, indicate the disks or blanks which are to be pressed. The axis of the molds or matrices is in the same straight line as the axis of the piston-rod. The molds are guided by a groove on the bench of the machine passing under the overhanging guide u , on which the box for receiving the pressed and completed buttons is situated, the said guides or slides u thus holding or embracing the molds completely.

At the back of the overhanging guides u there are apertures by which the atmospheric air is drawn down a tube o , which is provided with some suitable air-exhausting apparatus (not shown) and the produced draft of air so caused travels over the surface of the molds submitted to pressure. The tube o has a valve o' to regulate the air drawn in, and in this manner the outer surfaces of the molds are cooled and the polished appearance of the finished button is not impaired.

The molds are filled and emptied on the work bench or table n of the machine by the attendant. A division-piece i is fitted between the two united presses on the same frame, the position of which can be changed at will—*i. e.*, replaced by a thicker or thinner piece, according to the length desired to be given to the columns formed by the pairs of button-molds, and consequently according to the duration of the pressure. When there is not any pressure in the body of the pump the molds are taken from the slides by the hand. The extraction of the molds containing the pressed buttons takes place at the extremity of the line of molds which abut against the separation-piece where the pair of molds are only guided by the under groove.

The order of the operations to be performed by the attendant, (generally a woman or girl,) supposing she is working the left-hand press, is as follows: The attendant at a given moment takes out at the right-hand extremity of the row a pair of molds which were in contact with the separating-piece i and renews the pressure by means of the three-way cock r . The compressed buttons are then withdrawn

from the pair of molds and thrown into the box p for receiving same. The attendant then lays the press stamp or bolt which was held between the molds on the table n of the machine and places in each of the molds a blank to be pressed. This pair of molds is then placed in an oven (not shown) to be heated, just at the end of the other molds, which are in a line—namely, in the coldest part. Next the attendant takes from the oven the pair of molds which are at the opposite extremity of the row in the oven, and which is consequently the hottest, with the horn-blanks which are contained therein. She then inserts between one mold and the other the press stamp or bolt which is on the bench or table n , turns the cock r so as to cause communication between the press-cylinder and the exit m , takes out the pair of molds which are to the right of the column X X, near the separation-piece i , pushes the column forward a corresponding distance to the length of a pair of molds, inserts at the tail end of the column, in the slides, a pair of molds in which the press stamp or bolt has just been put, repeats the pressure, and so on.

One oven alone may be used for three double presses. It is preferred to place an oven in the center of a rectangle of which three presses form three sides, while the fourth is open for passage.

Having now particularly described and ascertained the nature of this invention, and in what manner the same is to be performed, we declare that what we claim as our invention is as follows:

1. In an apparatus for making buttons and equivalent articles, the combination of a plurality of molds arranged in a column or row, a pressing device for the row or column of molds, a stop against which the molds are pressed, and a guide arranged between the pressing device and the stop of a length sufficient to receive the said column or row of molds, substantially as set forth.

2. In a machine for making buttons or equivalent articles, the combination of a guide adapted to receive a number of molds containing the blanks, a device adapted to impart pressure to the said molds, and a fixed surface or stop, against which the molds are pressed, the guide being shorter than the distance between the said fixed surface or stop and the pressing device, whereby the molds may be taken from one end of the row beyond the guide and placed in front of the other end of the row beyond the other end of the guide, substantially as set forth.

3. The process of making buttons or equivalent articles, which consists in arranging the molds for the buttons in a row or column, compressing the said column of molds, then relieving the pressure and removing a finished button at one end of the row, inserting another button at the opposite end of the row, again compressing the column of molds, and

so on, advancing the column of molds each time one is removed from the end, substantially as set forth.

4. In a machine for making buttons or
5 equivalent articles, the combination of the cylinder *f*, the piston-rod *t*, the springs *t'* for causing the return or backward movement of the piston, the feed-canal *e*, which may be
10 made to communicate with the cylinder, and the supply-pipes conveying liquid under different pressures adapted to be brought into communication with the said canal, substantially as and for the purposes described.

5. In an apparatus for making buttons or
15 equivalent articles, the combination of the pressing devices, the overhanging guide *u*, having an aperture therein, an air-suction pipe communicating with said aperture, and the valve *O'* in the said pipe, whereby a draft

of air may be caused to act upon the molds 20 which are under pressure, substantially as set forth.

6. The combination of the cylinder *f*, pistons and piston-rods *t*, with springs *t'*, the valves *r*, exits *m*, canal *e*, and tubes *h h' h''*, 25 the guide-groove for the molds and division-block *i*, together with the air-draft pipe for cooling the said molds during pressure, all substantially as described and illustrated with reference to the accompanying drawings. 30

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

GIUSEPPE PONZIO.

DOMENICO ROBBIATTI.

Witnesses:

OTTORINO LAZZARIZ,

GIOVANNI SCURI.