United States Patent [19]

Maquignaz et al.

[11] **3,804,006**

[45] **Apr. 16, 1974**

[54] **MACHINE FOR EMBOSSING TYPE-WHEELS OF ROLLERS FOR OFFICE MACHINES**

[75] Inventors: **Mario Maquignaz; Bruno Benedetto; Antonio Lingeri,** all of Ivrea, Italy

[73] Assignee: **Ing. C. Olivetti & C., S.p.A.,** Torino, Italy

[22] Filed: **Feb. 3, 1971**

[21] Appl. No.: **112,357**

[30] **Foreign Application Priority Data**

Feb. 5, 1970 Italy 67363/70

[52] **U.S. Cl.** **101/5,** 72/88, 72/469

[51] **Int. Cl.** **B21b 5/00**

[58] **Field of Search** 72/80, 88, 111, 469, 407; 101/5, 6, 401.1, 401.2, 401.3

[56] **References Cited**

UNITED STATES PATENTS

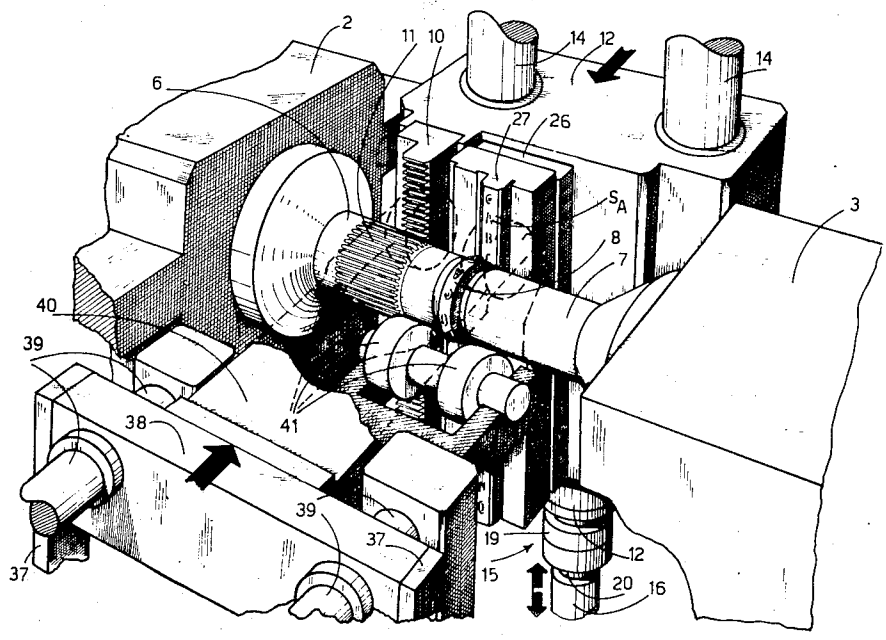
2,716,378	8/1955	George	101/6
3,084,572	4/1963	Starck	72/88
2,038,759	4/1936	Roberts	101/401.2
2,347,350	4/1944	Jung	72/88
2,602,397	7/1952	Last	101/5
3,166,008	1/1965	Lewandoski	101/6
3,308,645	3/1967	Hampton	72/88
2,679,204	5/1954	Hockenberger	101/5

Primary Examiner—Charles W. Lanham
Assistant Examiner—Gene P. Crosby
Attorney, Agent, or Firm—Schuyler, Birch, Swindler, McKie & Beckett

[57] **ABSTRACT**

Apparatus for the embossing of type on cylindrically shaped members, e.g., wheels or rollers is described. The die is a flat rectangular member with a surface thereof forming the active surface for embossing characters on to a semifinished wheel or roller. The flat active surface is reciprocated longitudinally of itself and in a direction perpendicular to the axis of the wheel or roller being embossed. In one embodiment the reciprocal motion of the die simultaneously rotates the semifinished wheel, while it is pressed against the latter. In a second embodiment a semifinished roller is pressed between diametrically opposed slides. These slides are caused to reciprocate in a direction perpendicular to the axis of the roller and 180° out of phase with respect to each other. The active surface is on the surface adjacent the roller on one of the slides.

5 Claims, 9 Drawing Figures



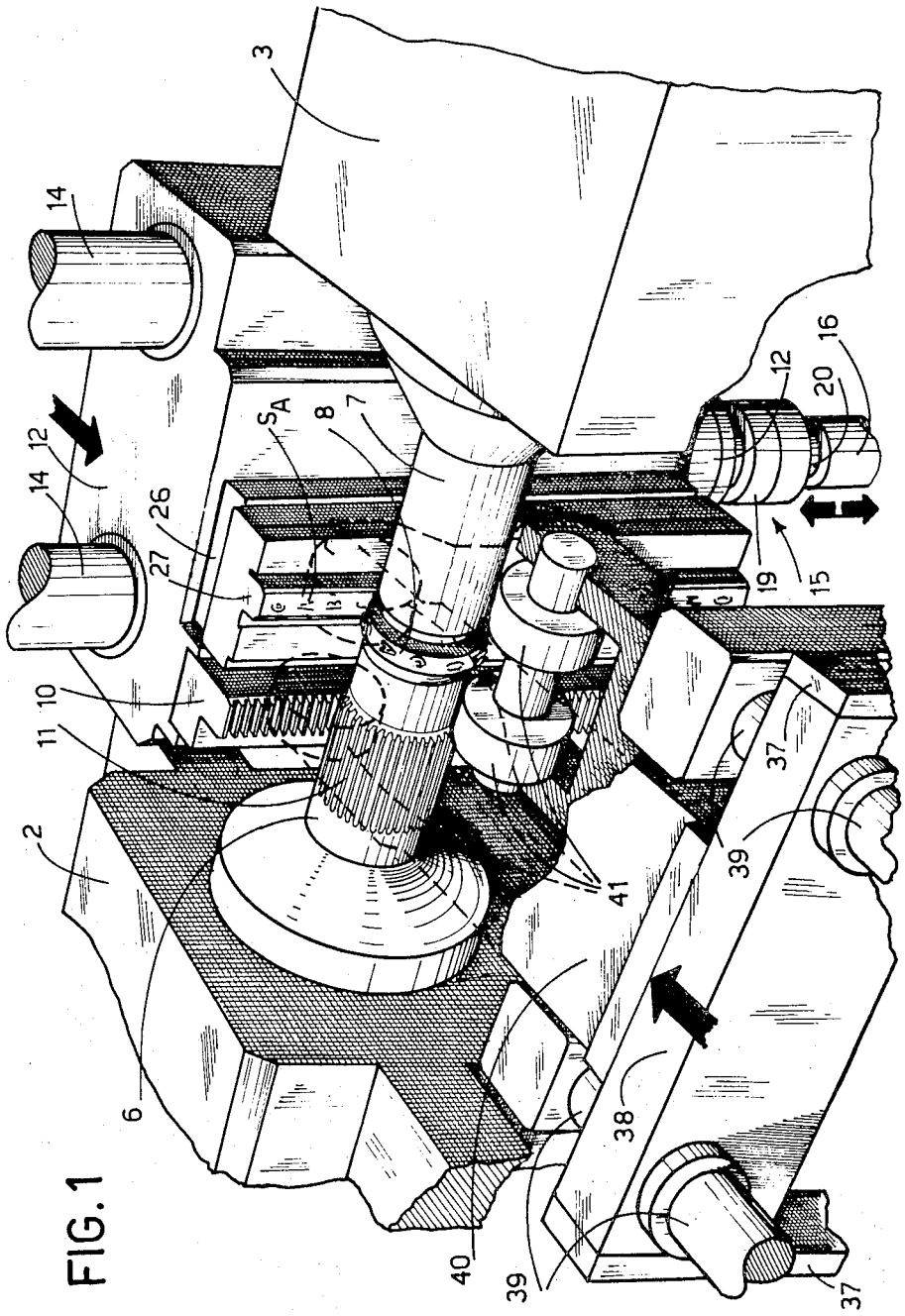


FIG. 1

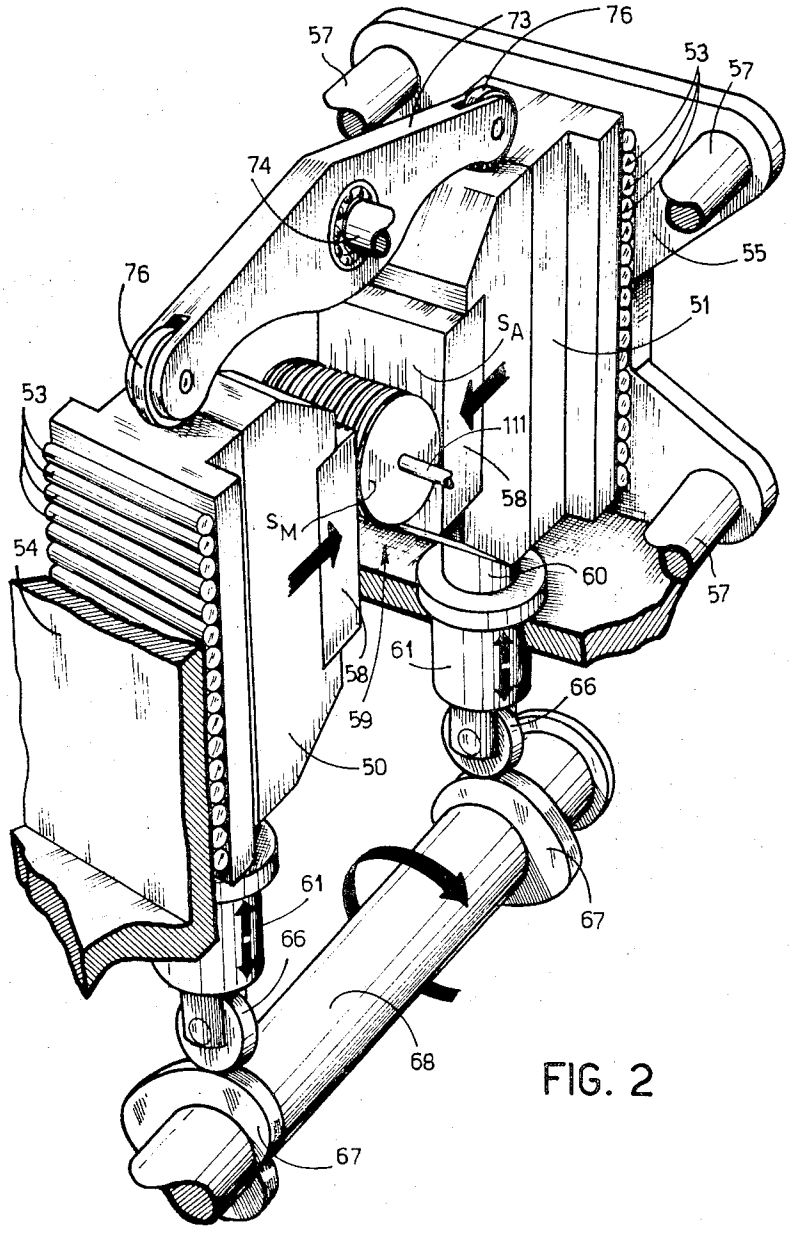

57
73
76
53
57
74
55
76
51
S_A
53
111
58
S_M
54
60
57
61
58
59
66
50
61
66
67
68
67

FIG. 2

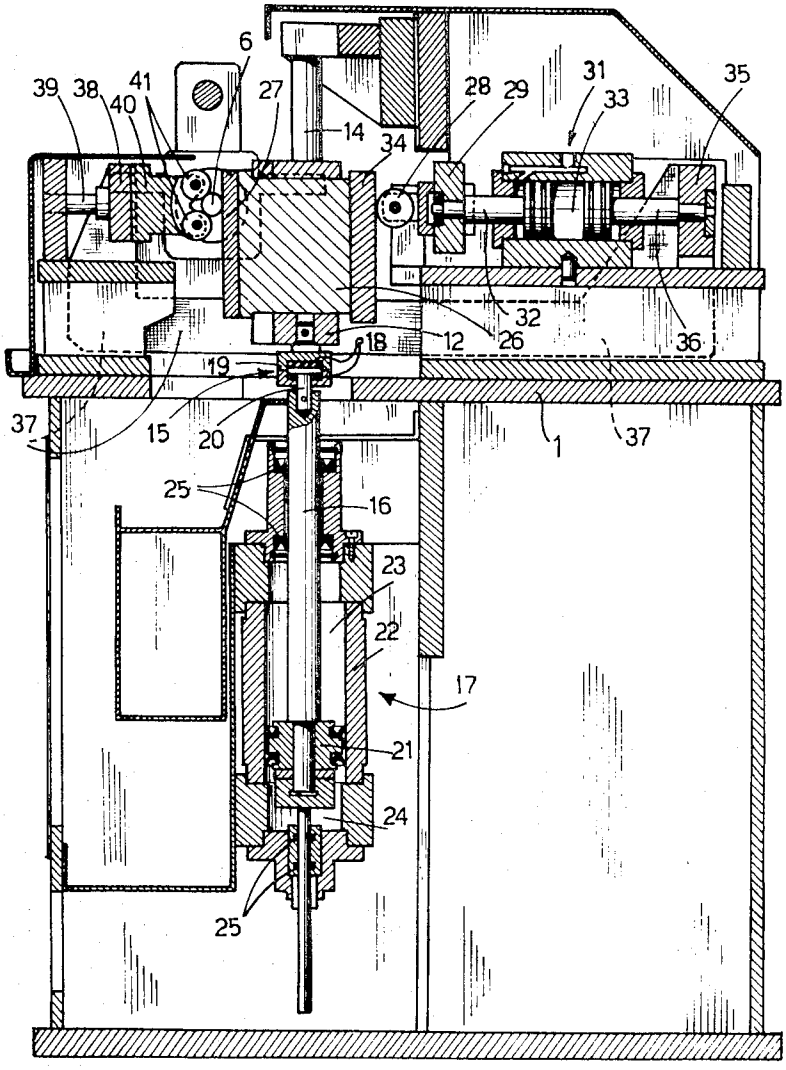

6
39
38
41
40
27
14
34
28
29
31
33
35
32
26
12
18
36
19
37
15
20
1
37
25
16
23
22
17
21
24
25

FIG. 3

FIG. 4

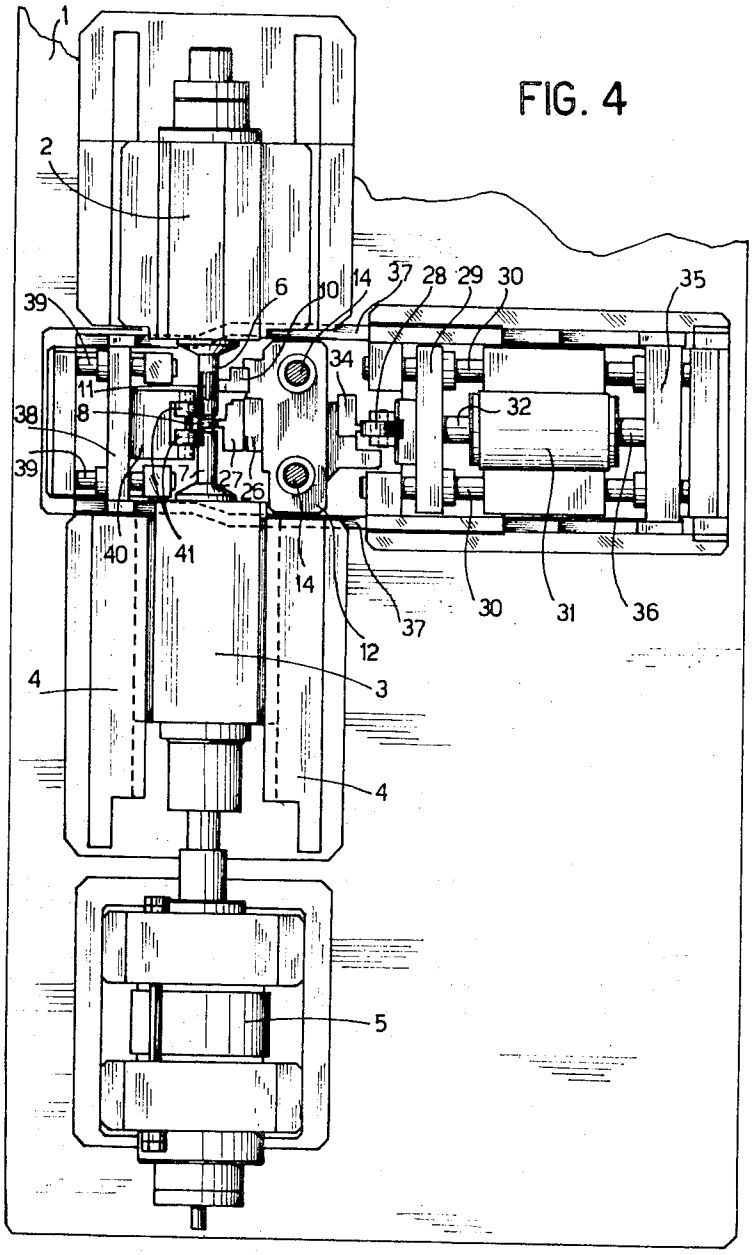

1
2
39
6
10
14
37
28
29
30
35
34
11
8
38
39
32
7
27
26
40
41
14
37
30
31
36
12
3
4
4
5

FIG. 5

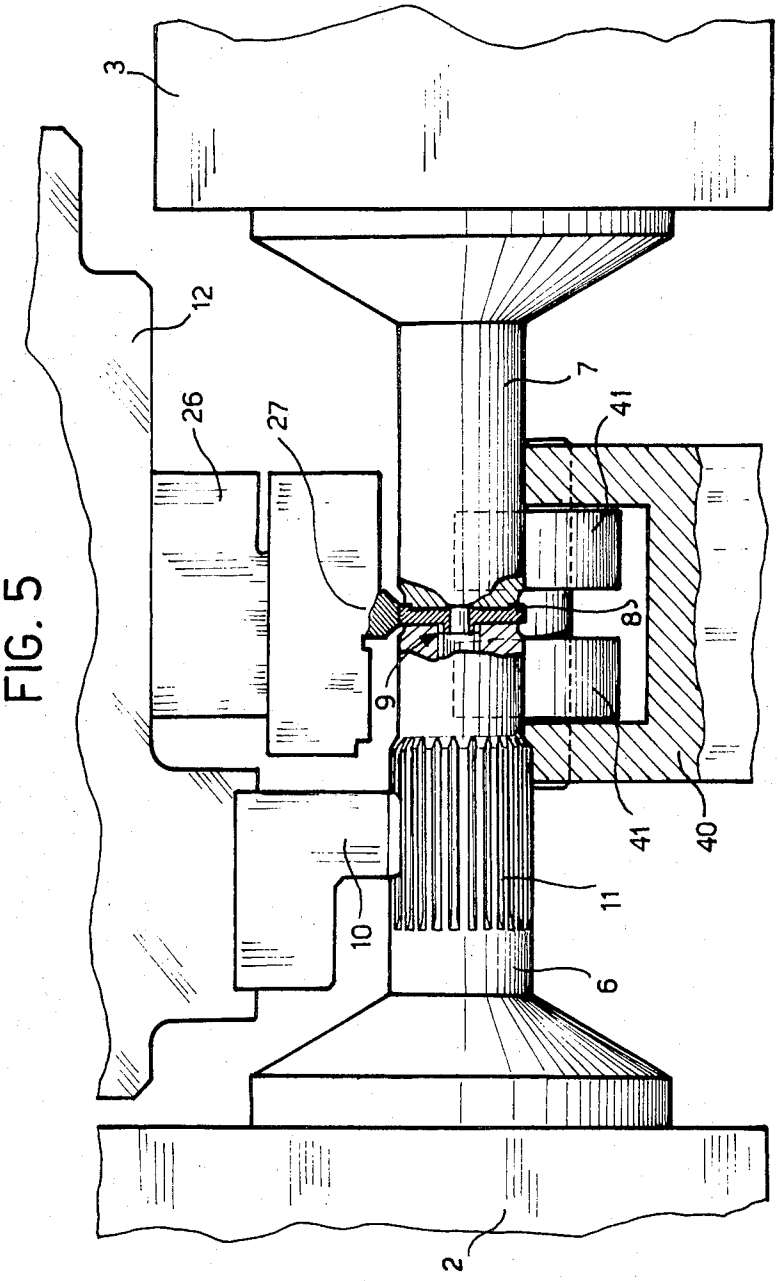
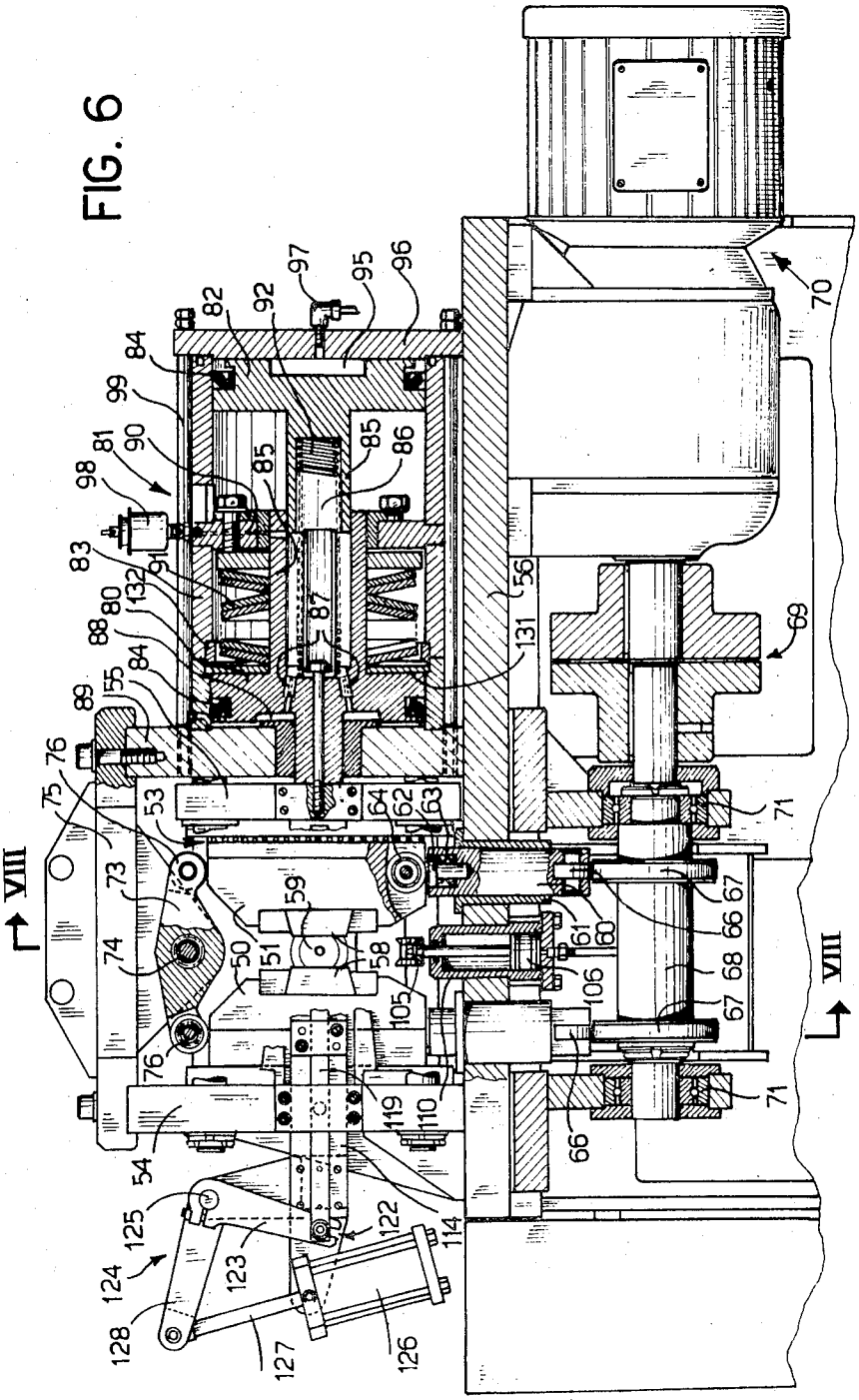


FIG. 6


VIII
VIII
70
69
71
97
95
96
82
92
84
99
81
90
98
85
86
83
91
132
80
87
88
131
56
84
155
89
76
75
53
64
62
63
73
59
74
50
51
58
105
76
119
110
54
125
124
122
114
123
128
127
126
61
60
67
66
68
106
66
71

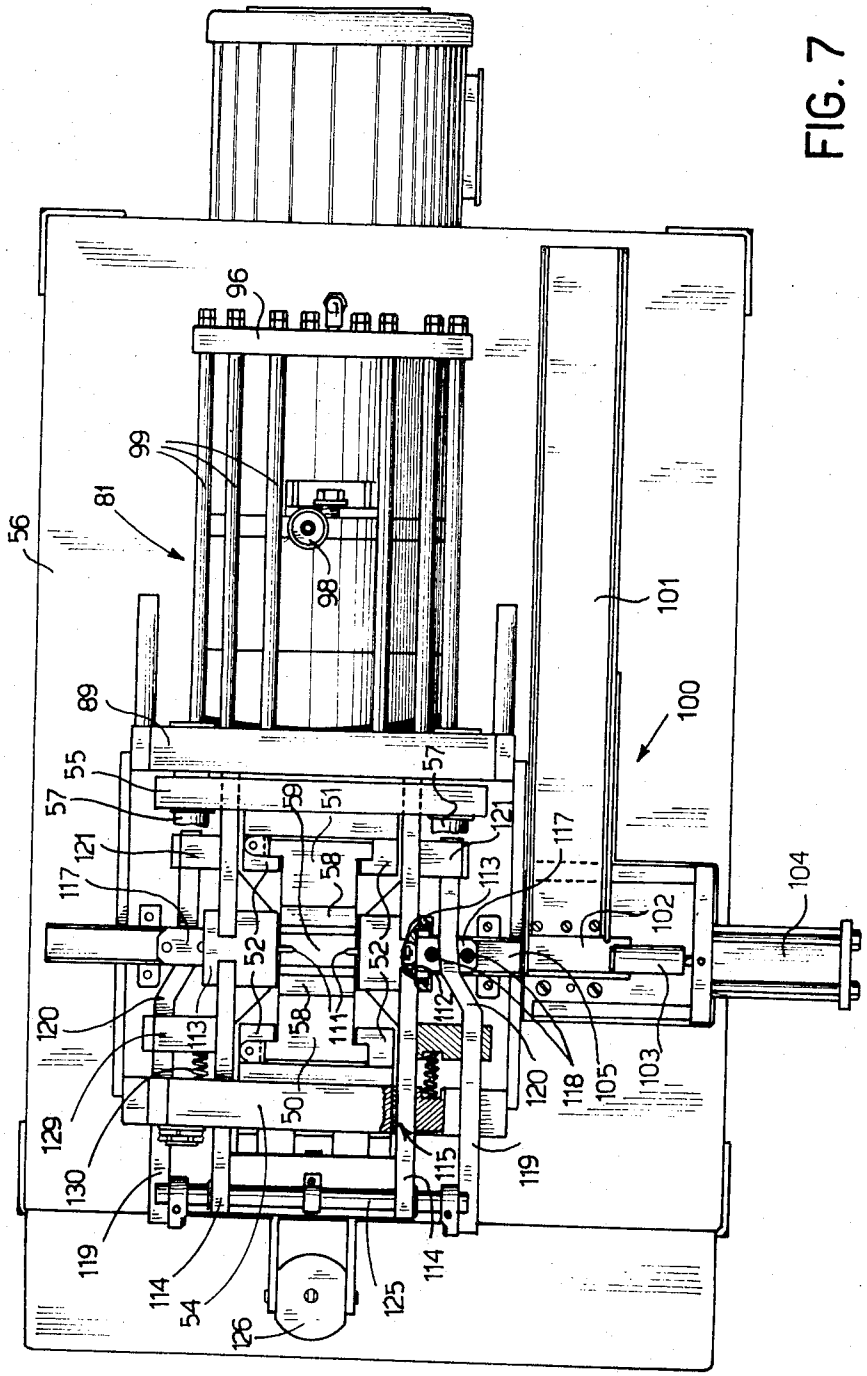
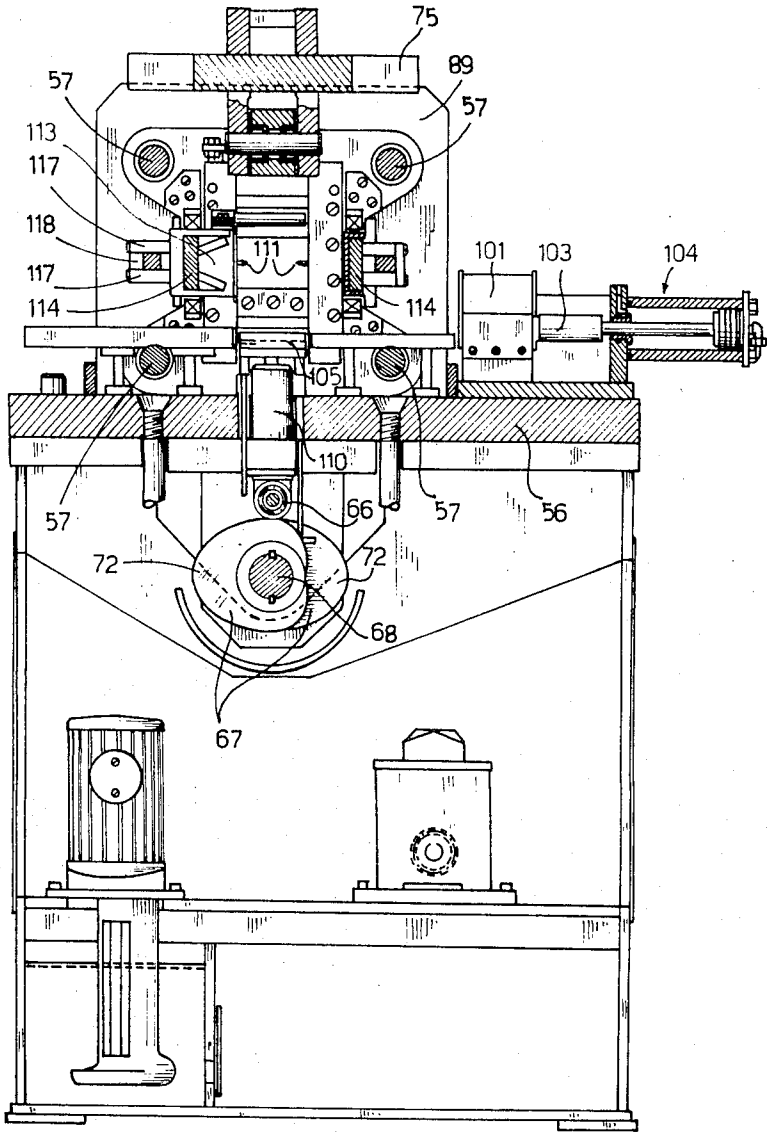

96
99
81
56
98
101
100
89
55
57
59
51
121
117
58
113
102
104
52
112
120
111
118
105
103
129
50
130
115
119
114
54
126
125

FIG. 7

FIG. 8


75
89
57
57
113
117
118
117
114
111
114
101
103
104
105
110
57
66
57
56
72
72
68
67

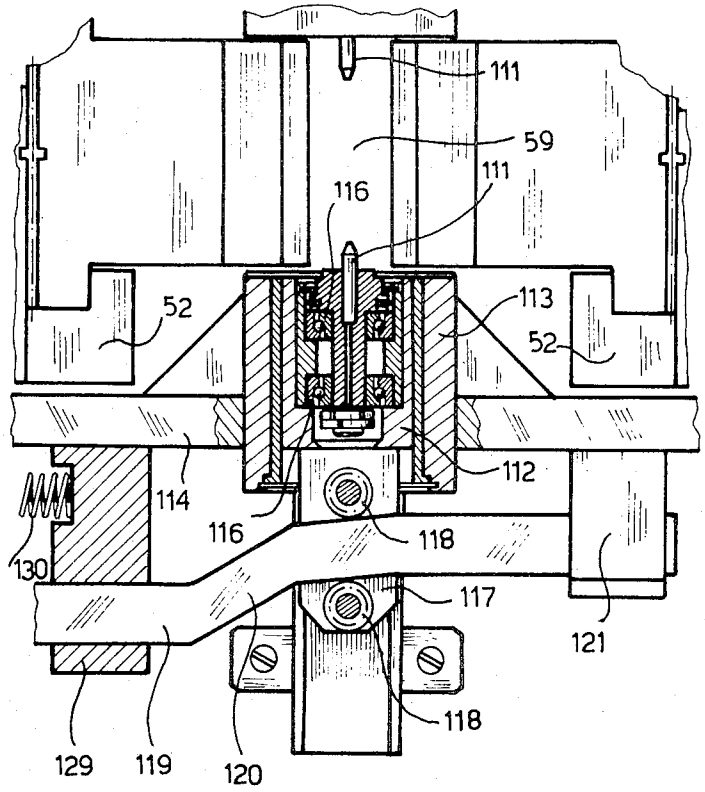

111
59
111
116
52
113
52
112
114
116
118
130
117
121
118
129
119
120

FIG. 9

MACHINE FOR EMBOSSING TYPE-WHEELS OF ROLLERS FOR OFFICE MACHINES

This invention relates to a machine for embossing type-wheels or rollers for office machines, which accomplishes this operation by means of a embossing tool or punch whose active surface is caused to roll and is simultaneously pressed against the outer surfaces of the wheels or rollers.

Type-wheels for office machines, whose outer surfaces carry a plurality of types or characters in relief, are normally obtained by a embossing operation which is carried out by means of a cylindrical embossing tool or punch that is pressed against and caused to roll on a semifinished product in the form of a small wheel. In order to reduce the stresses on the tool-spindle, due to the high working pressures, the diameter of the latter must be rather large; the same applies to the punch or embossing tool mounted thereon. Due to the large diameter of the embossing tool, on the outer surface of the latter (adapted to cooperate with the corresponding surface of the semifinished product) a number of sets of characters or types must be provided, which generates a single set of characters on the semifinished product.

However, the manufacturing process described above suffers from some drawbacks. First of all, owing to the unavoidable errors of pitch existing between the various sets of characters on the surface of the embossing tool, it is impossible to obtain an exact overlapping of the characters, on the embossing tool with those already formed on the semifinished product, with the result of small imperfections in the characters of the finished type-wheel. Moreover, due to the considerable accuracy and precision of manufacture required, a cylindrical embossing tool of the kind described is of difficult construction and therefore costly.

Type-rollers, comprising a plurality of type-wheels coaxial to one another and disposed side by side, also are normally obtained by a embossing operation carried out by means of a cylindrical embossing tool, which is pressed and simultaneously caused to roll on a cylindrical semifinished product. This operation is carried out on a special machine, comprising a pressure roller which pushes the semifinished product, supported thereon at two end cylindrical zones, against the embossing tool which is caused to rotate by suitable means.

This manufacturing process gives rise to further drawbacks, besides those already mentioned with reference to the embossing process of the type-wheels. In fact, since the semifinished product is supported by the pressure roller at the end zones only, the working pressures exerted by the embossing tool on the semifinished product are lower at the center, where the camber or convexity of the elastically deformed profile of the semifinished product is greater, and higher at the edges. This uneven distribution of the embossing pressures along the semifinished product gives type-rollers with a curved profile and a convexity facing outwardly, sine the permanent deformations produced by the coining are greater where the pressures are higher. Further, due to the aforementioned and cylindrical zones, the semifinished product will be longer than the finished type-roller and therefore an additional cutting operation is required in order to remove the end zones.

The object of the present invention is to avoid the disadvantages enumerated above.

According to the present invention, there is provided a machine for embossing characters on type-wheels or rollers, comprising a embossing tool provided with a flat active surface for generating the characters, means for supporting a wheel or roller so that the active surface cooperates with the side surface of the wheel or roller and exerts coining pressures thereon, and means for reciprocating the embossing tool in a direction perpendicular to that of the axis of the wheel or roller.

For a better understanding of the present invention, two embodiments thereof will now be described by way of example, with reference to the accompanying drawings, wherein:

FIG. 1 shows a perspective view of some parts of a machine constituting a first embodiment of the invention, during the operation of embossing a type-wheel;

FIG. 2 shows a perspective view of some parts of a machine constituting a second embodiment of the invention, during embossing of a type-roller;

FIG. 3 is a vertical section through the complete machine, a portion of which is illustrated in FIG. 1;

FIG. 4 is a plan view of the machine of FIG. 3;

FIG. 5 shows a detail (support spindle of the semifinished product), on an enlarged scale and partially in section, of the plan view of FIG. 4;

FIG. 6 is a vertical section through the complete machine illustrated in FIG. 2;

FIG. 7 is a plan view of the machine of FIG. 6;

FIG. 8 is a section of the machine of FIG. 6, taken along the lines VIII—VIII, and

FIG. 9 shows a detail, on an enlarged scale and partially in section, of the plan view of FIG. 7.

The first embodiment of the invention is adapted for embossing type-wheels and is illustrated in FIGS. 1, 3, 4 and 5.

On the machine frame 1 (FIG. 4) two slides 2 and 3 are mounted; the first slide 2 is stationary, while the second slide 3 is movable, being displaceable axially (in the vertical direction as seen in FIG. 4) along guides or ways 4 and driven by a hydraulic cylinder 5, which is also fastened to the machine frame 1. On each slide 2 and 3 there is rotatably mounted a corresponding spindle, 6 and 7 respectively (FIGS. 1, 4 and 5), and between these a semifinished type-wheel 8 can be clamped. The semifinished wheel is normally integral with a gear wheel, coaxial and disposed side by side therewith, which is housed in a corresponding recess with internal toothing 9 (FIG. 5) of the spindle 6.

The rotatable spindles 6 and 7 are mounted on ball bearings (not shown) housed in the corresponding slides 2 and 3, and the spindle 6 (FIGS. 4 and 1) is rotated by a rack 10 and a gear wheel 11; the rack is fastened to a slide 12, while the gear wheel is integral with and circumferentially surrounds said spindle.

The slide 12 (FIGS. 1, 3 and 4) is vertically movable along columns 14 and is lower end is connected, through an elastic coupling 15 (FIG. 3) to the rod 16 of a double-acting hydraulic cylinder 17. The elastic coupling 15 comprises a pair of members 18 (disk and ring) of soft material, such as for instance rubber, disposed in a recess of a body 19; between these two members is locked the head of a pin 20 secured to the rod 16. The rod 16 is integrally secured to a piston 21 which, with the casing 22 of the cylinder 17 defines an upper chamber 23 and a lower chamber 24 which are

tightly closed relative to the outside by means of seals 25 mounted in a usual manner, as is clearly shown in FIG. 3.

Inside the slide 12 (FIG. 3) a support 26 is adapted to slide in a direction perpendicular to the direction of movement of the slide 12; to this support there is fastened, in any suitable manner, a embossing die 27 with an active surface S_A (FIG. 1) facing the semifinished wheel 8. The support 26 coacts with a small wheel 28 revolving on a plate 29 (FIGS. 3 and 4) which is adapted to slide on columns 30 integrally secured to the machine frame 1. The plate 29, and therefore the support 26, can be pushed against the semifinished wheel 8 by a hydraulic cylinder 31 provided with a chamber 33 and whose rod is connected to the plate. During the aforementioned vertical displacement of the slide 12, the small wheel 28 revolves on a thin plate 34 secured to the support 26.

Another plate 35 is also adapted to slide on the columns 30. This second plate is disposed on the opposite side of the cylinder 31 to the plate 29 and is connected to a second rod of the cylinder. Two tie rods 37, substantially parallel to one another and disposed laterally relative to the cylinder 31 and the slide 12, each have one end fastened to the plate 35 and the opposite end secured to another plate 38, which is adapted to slide along the columns 39 integral with the machine frame 1. The plate 38 is connected to a support 40 on which two pairs of small wheels 41 are rotatably mounted (FIGS. 1, 3 and 4), the small wheels of each pair being adapted to abut against one of the spindles 6 and 7, on opposite sides of the semifinished type-wheel 8.

In operation, a semifinished type-wheel 8 with a central hole and integral gear wheel is mounted on the spindle 6 (FIGS. 1 and 5) by fitting the gear wheel inside the toothed recess in the spindle. This operation is carried out after the spindle 7 has been moved away from the spindle 6 by the slide 3 under control of the cylinder 5. Subsequently, the spindle 7 is pushed against the semifinished product 8, in order to clamp the latter between the two spindles.

Then, pressure fluid is fed into the chamber 33 (FIG. 3) of the cylinder 31; the corresponding pistons and the rods 32 and 36 integral therewith are displaced outwards; therefore, the plate 29 is pushed towards the front side of the machine (to the left, as seen in FIG. 3), thereby urging the small wheel 28 against the thin plate 34 of the support 26 which, in turn, will push — with an adequate pressure — the embossing die 27 against the outer surface of the semifinished product 8. Simultaneously the plate 35 is pushed by the same cylinder 31, towards the rear of the machine, and therefore, the tie rods 37, the plate 38 and the support 40, which carries the small wheels 41, are pulled in the same direction.

It is therefore apparent that, when oil under pressure is fed into the chamber 33 of the cylinder 31, a first action (embossing pressure) will be applied by the embossing die 27 to the semifinished type-wheel 8 and, simultaneously, the small wheels 41 will apply, to the spindles 6 and 7, a second action which is equal and opposite to the first action and adapted to balance the same, thereby preventing any distortion of the spindles.

By feeding pressure fluid alternately into each of the chambers 23 and 24 (FIG. 3) of the cylinder 17, the piston 21 and the slide 12 will be reciprocated up and down. During this movement, the rack 10 (FIGS. 1 and 5) will cause the spindle 6 to rotate, thereby rotating both the semi-finished product 8 and the spindle 7. The pitch diameter of the gear wheel 11 is such that, during the movement of the embossing die 27 relative to the semifinished product 8, a rolling motion without sliding takes place between the active surface S_A of the tool and that of the semifinished wheel 8 on which the characters in relief must be stamped. During this relative motion, the die 27 will apply to the semifinished product 8 pressures adapted to plastically deform the wheel and to form the characters or types in relief.

After an adequate number of passes (i.e., reciprocations of the slide 12), depending on the kind of characters to be obtained on the wheel, the finished type-wheel can be discharged from the machine, by reversing the operations described above.

The active surface S_A of the embossing tool 27 preferably carries a single set of characters or types, as contrasted with the embossing devices of the prior art wherein, on the outer surface of the cylindrical embossing tool, a number of sets of characters is reproduced, for the reasons set forth above. Therefore, no damage to the characters of the type-wheel, such as those produced by errors of pitch between said sets of characters of the embossing tool, are likely to occur.

Preferably, but not necessarily, the spindle 7 and the slide 3 (FIG. 4) can be associated with devices adapted to perform additional operations on the type-wheel 8. For instance, a broaching spindle can be provided, adapted to move axially inside the spindle 7 and driven by a hydraulic cylinder like the cylinder 5. The broaching spindle broaches the inner hole of the type-wheel 8, which may be deformed in the embossing operation proper.

FIGS. 2, 6, 7, 8 and 9 show a second embodiment of the invention, adapted for embossing type-rollers.

Two slides 50 and 51 (FIGS. 2, 6 and 7) are adapted to slide vertically in guides 52 (FIG. 7) against rollers 53 (FIGS. 2 and 6) backed by plates 54 and 55. The plate 54 is fastened to the machine frame 56 while the plate 55 is longitudinally slidable on columns 57. To the slides 50, 51 there are fastened stamping tools 58, whose active faces S_A are directed towards a working region 59 in which is disposed a semifinished roller S_M (shown in FIG. 2 only).

Each slide is pushed upwards, as seen in FIG. 6, by a corresponding rod 60 housed in a bush 61, whose upper end coacts, through a pin 62 resiliently mounted on springs 63, with a small wheel 64 adapted to rotate on the lower part of the slides 50 and 51. The lower end of each rod 60 abuts, via a small wheel 66, against a corresponding cam 67.

The cams 67 are integral with a shaft 68 driven by an electric motor and reduction gear unit 70 through a clutch 69. The shaft 68 is supported by a pair of ball bearings 7 in trunnion plates fastened to the machine frame. The cams 67 are offset by 180° from one another (FIG. 8) and each of them is substantially heart-shaped with an active lobe 72. A rocking lever 73 (FIGS. 2 and 6) pivotally mounted, by means of a pin 74, on an upper plate 75 (FIG. 6) which is integral with the machine frame 56, has a pair of arms provided with small wheels 76 which rest upon the upper surface of the slides 50 and 51.

The plate 55, which carries the slide 51, is integral with a piston 80 of a cylinder 81, which further comprises a second piston 82 slidably mounted, as is the

first piston, inside the casing **83** of the cylinder. Both pistons **80** and **82**, provided with usual ring seals **84**, have sleeve-shaped extensions **85** telescoped one inside the other and defining a chamber **86** of variable capacity, adapted to be filled with a hydraulic fluid, for instance, oil. The chamber **86** is in communication through gauged holes **87**, with a chamber **88** defined by the piston **80** and the surface of a plate **89** to which the cylinder **89** is secured. A wall **90**, which is stationary relative to the casing **83** of the cylinder **81**, acts as a support for a plurality of cup-shaped springs **91**, which normally urge the piston **80** leftwards, as seen in FIG. **6**. Inside the chamber **86**, a coil spring **92** normally urges the piston **82** to the right, as seen in FIG. **6**. A chamber **95**, defined between the piston **82** and the end cover **96** of the cylinder **81**, is in communication, through a duct **97**, with a suitable source of hydraulic fluid (not shown). for instance, compressed air.

A small reservoir **98** of oil is in communication, through a duct (shown in broken lines in FIG. **6**) provided in the wall **90** of the cylinder **81**, with the chamber **86** of the cylinder. Preferably, the casing **83** of the cylinder **81** is formed, as shown in FIGS. **6** and **7**, by a plurality of annular members held together by tie rods **99** screwed to the plate **89** and the cover **96** of the cylinder.

An automatic loader **100** (FIG. **7**) comprises a stationary guide **101** adapted to receive a plurality of semifinished rollers. The guide feeds the rollers to a zone **102**, where a small plunger **103**, driven by a hydraulic cylinder **104**, is adapted to push a semifinished roller onto a movable guide **105**. This movable guide **105** is integral with the rod of a piston **106** (FIG. **6**) of a hydraulic cylinder **110**, adapted to raise the guide so as to bring the semifinished roller into the working region **59** between the two embossing dies **58**.

Two centering spindles **111** (FIGS. **2**, **7** and **9**), revolving inside corresponding bushes **112** (FIG. **9**) can be displaced axially by movement of the bushes which are slidable in boxes **113** fastened to cross members **144**. These cross members **114** (FIG. **7**) are free to slide in the axial direction inside seats **115** of corresponding cross section provided in the stationary plate **54** and in the movable plate **55**. Each bush **112** (FIG. **9**) rotatably supports, by means of a pair of bearings **116**, the corresponding spindle **111** and is provided with a pair of lugs **117** (FIGS. **9**, **7** and **8**) to which a pair of small rollers **118** is fastened; between the small rollers of each pair a rod **119** passes; the rod comprises a sloping section **120** between two straight sections parallel to the longitudinal axis of the machine.

Each rod **119** has one end adapted to slide in a corresponding guide **121** (FIG. **7**) integral with one cross member **114**, while the other end is coupled in a slot **122** (FIG. **6**) provided in one arm of a bell-crank lever **124**. This bell-crank lever is pivotally mounted, by means of a pin **125**, to an extension of the cross members **114** and can be pivoted by a hydraulic cylinder **126** whose rod **127** is pivotally mounted on one arm **128** of said lever. Preferably, but not necessarily, a plate **129** is fastened to the cross member **114** (FIG. **7**), biased by springs **130** resting upon the plate **54** of the machine frame.

In operation, assume first that the pistons **80** and **82** (FIG. **6**) of the cylinder **81** are in the positions shown in FIG. **6**, that is to say in the respective end-of-stroke positions inside the cylinder. This condition occurs when air has been discharged from the chamber **95**. In the absence of compressed air in the chamber, the spring **92** inside the chamber **86** will hold the piston **82** to the right, as seen in FIG. **6**, while the cup-shaped springs **91** will hold the piston **80** (and therefore the plate **55** upon which the slide **51** rests) to the left.

Now, by feeding compressed air into the chamber **95** through the duct **97**, the piston will be displaced to the left and, during its stroke, the oil contained inside the chamber **86** will be pressurized and caused to flow out through the gauged holes **87**, until it reaches the chambr **88**. Due to the high ratio between the surfaces of the cross sections of the piston **82** and the chamber **86**, the oil contained inside the latter is brought to a pressure far higher than that of the air compressed in the chamber **95**, the pressures of the two fluids being in the same ratio as that of the two surfaces (in the example shown, this ratio is about **1** to **14**). The oil under pressure, flowing into the chamber **88**, will act upon the piston **80** of large surface, applying to the latter a force directed to the right, as seen in FIG. **6**, which is sufficient to overcome the bias exerted by the cup-shaped springs **91**. In this manner, the piston **80** — with the plate **55** and the slide **51** — will be displaced to the right, until a part integral with the piston (which, in the example shown comprises a ring **131**) will abut against a stop (i.e., a ring **132**). In these conditions, the zone **59** comprised between the embossing tools **58** becomes sufficiently wide for introducing therein a semifinished type-roller.

The semifinished roller S_M is of substantially cylindrical shape and is provided with a plurality of grooves separating the various type-wheels forming the finisheed type-roller, as well as with a pair of axial end holes for the introduction of the spindles **111** (FIGS. **2**, **7** and **9**) which support the roller during machining. The semifinished rollers are manually loaded on the stationary guide **101** (FIG. **7**) on which they will roll to reach the zone **102**. In order to push the semifinished products up to the working area, the cylinder **104** is actuated, whereby the small plunger **103** pushes a roller on to the guide **105**. By repeating this operation a suitable number of times, the semifinished roller will be pushed below the working area **59** (FIG. **6**). Then the cylinder **110** is actuated, which will raise the guide **105**, thereby bringing the roller disposed thereon into the working region between the embossing tools **58**.

Before the semifinished roller reaches the working region, and simultaneously with the aforementioned operations of automatic displacement of the semifinished roller, the piston **126** is actuated (FIG. **6**), so as to pivot the lever **124** in a counterclockwise direction and, therefore, to axially displace the rods **119** (FIGS. **6** and **7**). By the end of this displacement, the sloping section of each rod, **120**, which in FIG. **7** is on the left hand side of the small rollers **118**, will be on the opposite side of the small rollers. The sloping sections **120**, by coacting with the small rollers **118**, will displace the bushes **112** (FIG. **9**), which will slide in the boxes **113**, thereby moving the spindles **111** away from the working region **59** and allowing the insertion of the semifinished roller between them.

After the semifinished roller has been brought into the working region in the manner described above, by actuating again the piston **126** the rods **119** are brought back to the position shown in FIG. **7**, thereby inserting

the spindles **111** inside the end holes of the semifinished roller.

By subsequently releasing the air pressure inside the chamber **95** (FIG. **6**), the piston **82** is brought back to the right hand end-of-stroke position by the spring **92,** the oil contained in the chamber **88** flows into the chamber **86** and the piston **80** is pushed to the left by the action of the cup-shaped springs **91.** In this manner, the slide **51** is pushed against the semifinished roller and the two embossing tools **58** will exert thereon pressures which depend only on the force exerted by the springs **91,** that can obviously have any predetermined value. It is to be noted that, during the application of the pressure on the semifinished product, besides the displacement of the slide **51** to the left, a displacement of the semifinished product carried by the spindles **111** in the same direction but equal to one half of the displacement of the slide will take place, due to the fact that the cross members **114** (FIG. **4**), which are integral with the boxes **113,** are movable axially relative to the plates **54** and **55,** as already stated.

Now, by energizing the electric motor **70** (FIG. **6**), the shaft **68** — which is integral with the cams **67** — will be rotated. These cams will reciprocate vertically the rods **60,** and therefore corresponding slides **50,** and **51** which rest thereon. The rocking lever **73,** whose arms act upon the upper surfaces of the slides **50** and **51,** ensures that as one slide moves up, the other moves down.

Therefore, the semifinished roller mounted on the spindles **111** is roller to and fro by the embossing rolls **58,** while pressure sufficient for stamping the characters are exerted thereon.

Upon completion of the embossing operation, the type-roller is discharged from the machine, by reversing the operations described above. After the slide **51** has been displaced to the right, as seen in FIG. **7,** the plate **129,** urged by the springs **130,** will displace the cross members **114** and therefore the spindles **111,** in the same direction, thereby separating the finished type-roller from the embossing tool of the slide **50,** to which tool the roller could just possibly adhere.

The embodiments of the invention described hereinabove are only exemplary of the principles of the invention. The scope of the invention is defined by the appended claims and is not limited by the descriptive material hereinabove.

We claim:

1. Apparatus for embossing a cylindrically shaped blank to have at least a row of characters extending circumferentially therearound, comprising:

means for supporting said cylindrically shaped blank in said apparatus in a position to permit embossing on the circumferential surface thereof,

said supporting means comprising a pair of rotatable spindles having opposed end surfaces adapted to receive said cylindrically shaped blank, one of said spindles being axially movable relative to the other to permit said means for supporting to receive said cylindrically shaped member,

a movable die member having an active surface adjacent said circumferential surface when said cylindrical shaped blank is supported by said supporting means,

said active surface being a flat surface having characters to be embossed arranged thereon,

means for moving said die member laterally towards said cylindrically shaped blank so that said active surface contacts said circumferential surface ane exerts embossing pressure on said circumferential surface and for removing said die member laterally from said cylindrically shaped blank,

means for urging said spindles towards said die member causing an equal and oppositely directed force to be exerted on said spindles relative to the force applied by said die member to said cylindrically shaped blank, and

means for reciprocating said die member in a direction perpendicular to the axis of said cylindrically shaped blank.

2. Apparatus for embossing a cylindrically shaped blank to have at least a row of characters extending circumferentially therearound, comprising:

means for rotatably supporting said cylindrically shaped blank in said apparatus in a position to permit embossing on the circumferential surface thereof,

said supporting means including:

means for rotating said cylindrically shaped blank,

a movable die member having an active surface adjacent said circumferential surface when said cylindrically shaped blank is supported by said supporting means,

said active surface being a flat surface having characters to be embossed thereon,

means for moving said die member laterally so that said active surface contacts said circumferential surface and exerts embossing pressure on said circumferential surface, and

means for reciprocating said die member in a direction perpendicular to the axis of said cylindrically shaped blank.

3. The apparatus defined in claim **2** wherein said means for rotating includes means for giving the circumferential surface of said cylindrically shaped blank a tangential velocity equal to the linear velocity of said reciprocating die member.

4. The apparatus defined in claim **2** wherein said means for supporting comprises a pair of rotatable spindles having opposed end surfaces adapted to receive said cylindrically shaped blank, one of said spindles being axially movable relative to the other to permit said means for supporting to receive said cylindrically shaped member.

5. The apparatus defined in claim **4** further including means for urging said spindles toward said die member causing an equal and oppositely directed force to be exerted on said spindles relative to the force applied by said die member to said cylindrically shaped blank.

* * * * *