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COMPLETE SPECIFICATION

Improved Impression-device for Printing-adding Machines

We, OLIVETTI S.A.M.O.A., a Body Corporate organised and existing under the laws of Italy, of Via Clerici 4, Milan, Italy, and RICCARDO LEVI, an Italian

5 Subject, of Via Bezzacca 11, Torino, Italy, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 In printing-adding machines the figures are typed by the impact of apposite type on paper supported by a rubber roller, the type being struck by a hammer actuated
15 by the machine. The noise of the double impact (hammer against type and type against roller) is generally the loudest of the many produced by the complex mechanism of the machine, particularly
20 as, owing to obvious necessity of affording visibility, the zone where the noise is produced cannot be enclosed in sound damping casings.

25 The present invention has for its object to reduce this noise as much as possible, whilst yet obtaining a satisfactory typing. The invention consists in an improved impression-device for printing-adding machines characterised in that a lever
30 acting on rods bearing the type, is controlled by a toggle system of articulated bars controlled by a spring, said system being formed and arranged so that towards the end of the active stroke
35 the pivots of the toggle system are brought into alignment so that the printing of the type takes place under the action of a static pressure instead of a blow.

40 The attached drawing represents diagrammatically the device according to the invention.

Fig. 1 showing the mechanism in the position of rest.

45 Fig. 2 illustrates the same mechanism in the working position.

Fig. 3 is a view in cross section of the controlling mechanisms.

50 A horizontal rack 1 transmits motion by means of a pinion 2, pivoted at 3, to a vertical rack 4, guided as shown at 5 and 6. Said rack 4 is provided with a series of independent rods 7 which have heads 9 bearing the type in relief and are main-

[Price 1/-]

55 tained in the position of rest (to the right in the drawings) by springs 8. The same heads 9 constitute the stops in the rest position for the rods 7 under the action of the springs 8. A lever 11 is pivoted on a robust journal 10 and is provided with a head 12 for acting upon the rods bearing
60 the type. According to the position of the rack 4 the figure to be printed on the paper will be selected.

65 The parts described above are normally present in known machines. In these, however, the lever 11 has the feature of a real hammer and, being actuated by a spring, makes a considerable displacement before striking against the rods bearing
70 the type, in order to acquire a sufficient kinetic energy.

75 According to the present invention, the lever 11 has a very short stroke and acts, as will be seen later, with a reduced speed against the type, moving the same into contact with the roller 13 at a speed which is almost nil. The lever 11 is not actuated directly by a spring but is connected to a link 15 through a pivot 14 and said link
80 is connected through a pivot 16 to a plate 17 pivoted at 18. The plate 17 is subjected to the action of a spring 19 fixed at 20 to the frame of the machine, and is provided with a tooth 21 acting as a stop against a universal bar 22 pivoted at 23.
85 Another universal bar 24 pivoted on the same pivot 18 as the plate 17 tensions the springs 19 again in a manner yet to be described. During the first part of the operation of the machine the racks 1 and 4
90 assume the correct position corresponding to the arithmetic operation required and the bar 24 is lowered to remove it from plates 17 so as not to hinder the movement of the latter. These, after a slight displacement are arrested by engagement of
95 the teeth 21 with the bar 22. As soon as the rack 4 has reached its correct position, the bar 22 is lowered by suitable means, thus releasing the plates 17. Said plates
100 thereupon rotate, under the action of their springs 19 and move links 15 and the levers 11 so that the latter actuate the pins 7 bearing the type.

105 A characteristic of the system is that the three pivots 18, 16 and 14 during their

motion tend to become aligned reaching exactly, or practically so, this position of alignment at the moment that the type touches the roller 13 (see Fig. 2). Thus, the velocity wherewith this contact takes place is almost nil with the result that said contact is noiseless, whilst the rotary speed of the plate 17 is very high. The pressure with which the characters are pressed against the roller 13, therefore, is very high, being achieved by alignment of a toggle system as in an ordinary mechanical press. The inertia of the plate 17, which is finally balanced by the pressure of the type on the roller, allows the achievement of a considerable moment of rotation on the axis of pivot 18 and a very powerful one on the axis of pivot 10. When the figure has been printed, the universal bar 24 lifts again bringing the plates 17 as well as the levers 11 and the type pins 7 back to the rest position, after having brought the pivots 18, 16 and 14 out of alignment. The universal bar 22, meanwhile, is returned to the rest position against a stop 26, by the spring 25. The plates 17 during their return motion, under the control of the universal bar 24, impart downward movement to the bar 22 by the rear faces of the teeth 21, until they pass the same at the end of the cycle, returning to a position where it constitutes a stop for the same.

For an understanding of the motion of the two universal bars 22 and 24 it is necessary to refer to Fig. 3. A driving shaft 27 capable of rocking through about 90°, bears a cam 28 of suitable edge profile locked thereon, said cam being also provided with a pin 29. Two arms are rigidly connected with the bar 24; one bearing a roller 30 resting continuously on the profiled edge of the cam 28, the contact being maintained by a spring 31. The cam has a long portion 32 concentric with the axis 27, during the passage of which the bar 24 remains stationary, an inwardly inclined portion 33 and a final circular portion 34 also concentric with axis 27 but of shorter radius than part 32. The portion 33 allows the bar 24 to disengage from the plates 17 and the plates are kept in this disengaged position by the portion 34. The bar 22 bears a nose 35 rigid therewith which, at the end of the forward cycle, engages with the pin 29 on the cam 28. The plates 17 are thus

disengaged and the printing is effected. In the return cycle of the driving shaft 27, firstly the pin 29 is disengaged from the nose 35 of the bar 22, and the latter is brought by the action of the spring 25 back against the stop 26. Then the roller 30 in following the inclined portion 33 of the cam 28, lifts the bar 24 and brings again the plates 17 as well as the cinematic members connected therewith back to their previous position, and again tensioning the springs 19 until finally the roller 30 coming to the circular portion 32, the whole system returns to the rest position.

It is evident that the mechanisms above described are only an example of control of the principal parts of the writing group which is the subject of the present invention.

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

1. Improved impression-device for printing-adding machines characterised in that a lever acting on rods bearing the type, is controlled by a toggle system of articulated bars controlled by a spring, said system being formed and arranged so that towards the end of the active stroke the pivots of the toggle system are brought into alignment so that the printing of the type takes place under the action of a static pressure instead of a blow.

2. Machine as claimed in claim 1, wherein the driving device comprises an oscillating plate (17) and a connecting rod or link (15) pivotally connected to said plate and to the lever acting on the pins bearing the type, so that towards the end of the active stroke the pivot (18) on which rocks the plate (17) and the two pivotal connections (14, 16) of the connecting rod (15) are brought into alignment.

3. Machine as claimed in claim 2, wherein the spring actuating the system operates upon the oscillating plate so as to effect the rotation thereof, said plate having a considerable rotary moment of inertia, whereby it can accumulate the energy derived from the spring.

Dated this 7th day of March, 1939.

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Fig. I

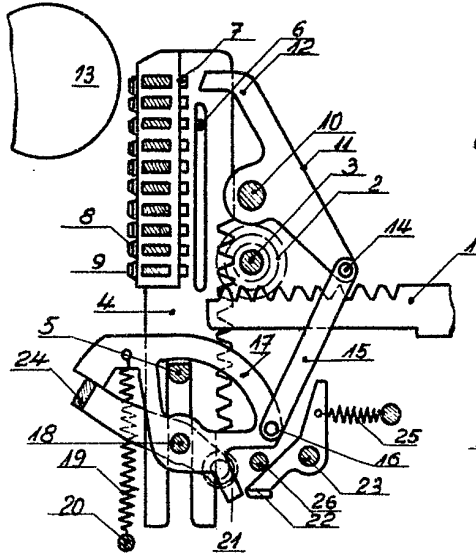


Fig. II

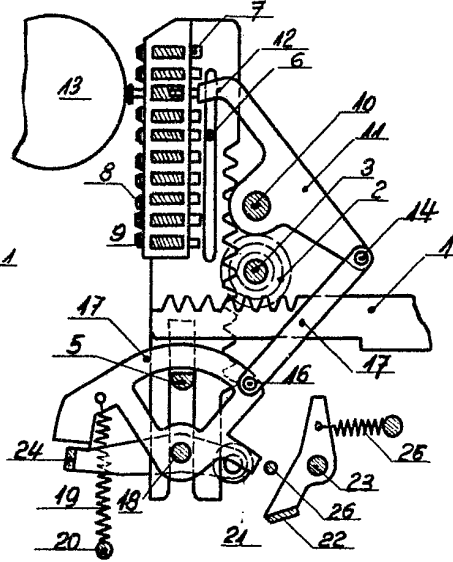
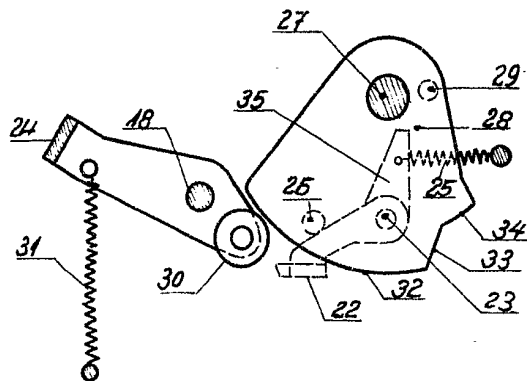


Fig. III



[This Drawing is a reproduction of the Original on a reduced scale.]