May 19, 1959 H. SCHMIDT ET AL 2,887,207

FEED-IN MECHANISM OR ATTACHMENT FOR BOOKKEEPING, CALCULATING AND LIKE MACHINES

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Fig. 1

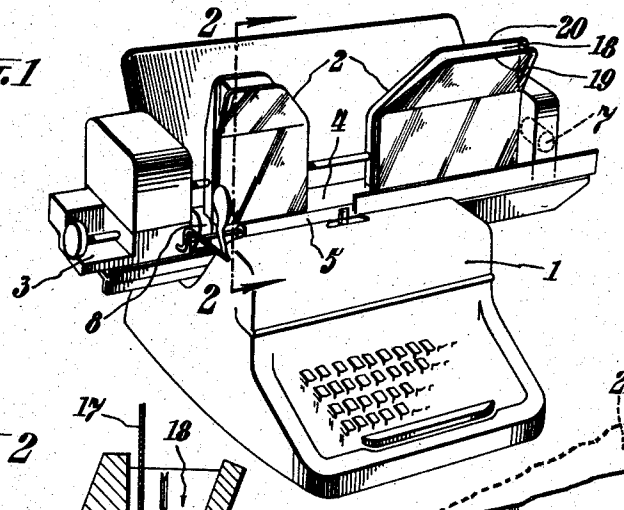


Fig. 3

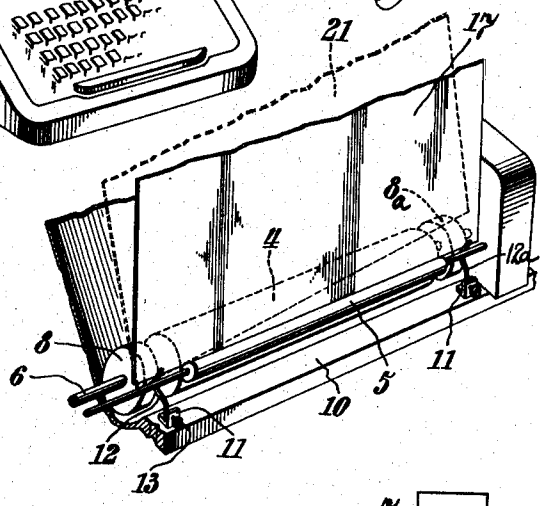


Fig. 2

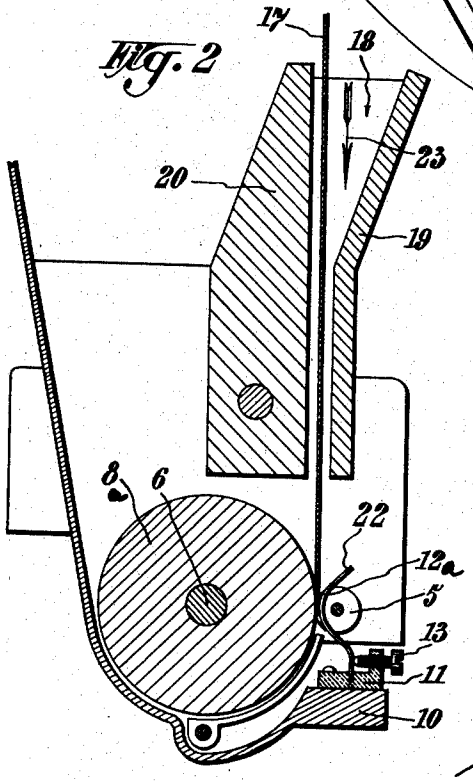


Fig. 4

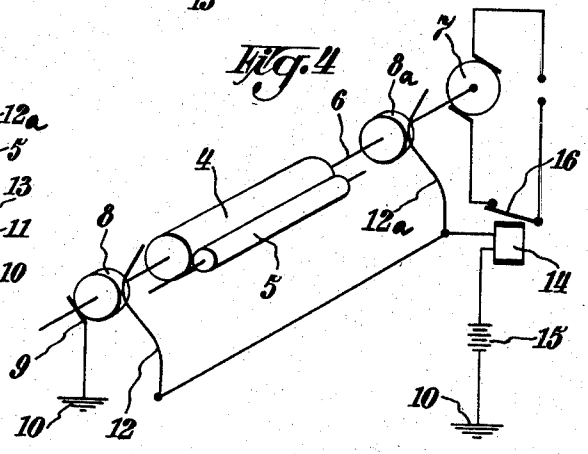
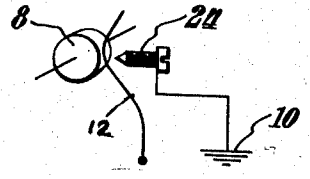


Fig. 5



Inventor
Heinz SCHMIDT
Horst FISCHER
By Leon M. Strauss
ATT.

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FEED-IN MECHANISM OR ATTACHMENT FOR BOOKKEEPING, CALCULATING AND LIKE MACHINES

Heinz Schmidt and Horst Fischer, Frankfurt am Main, Germany, assignors to Taylorix Organisation, Stiegler, Hausser & Co., Stuttgart, Germany, a firm of Germany

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9 Claims. (Cl. 197—128)

This invention relates to an attachment for typewriting, calculating, controlling, bookkeeping and like machines to effectuate pulling-in, guiding and holding cards, sheets and like plate-like carriers to be operated in such machines.

Heretofore known devices for introducing, guiding and maintaining in position a sheet or sheets of the aforesaid type necessitated after inserting the same into a funnel-shaped feed inlet a correct adjustment of such sheet by hand, so that said sheet or sheets could be imprinted or inscribed in accordance with proper line spacings. This insertion by hand, however, led to considerable loss in time and was nevertheless mostly inaccurate for all practical purposes.

In order to overcome these and other inherent deficiencies, devices have already been proposed which employ driven pairs of gears or like toothed wheels, the teeth of which reach into a funnel-shaped inlet to serve the purpose of engaging and adjusting the sheets to a desired position. Such known constructions, however, are quite expensive as far as their manufacture is concerned and very often require adjustments and repairs. Besides this, it becomes necessary to provide in the sheets special predetermined perforations which occupy a certain portion of each sheet and must be arranged a predetermined distance from the sheet edges thereby causing a considerable reduction of the effective writing areas or surface of the sheet. Furthermore, if the zone of contact of the gears with the respective sheet is not exact or accurate enough, tearing or damaging of the perforations will ensue, so that the entire sheet will finally become unusable. The perforations of the account sheet also considerably increase the cost of the same.

The present invention tends to avoid the aforesaid and other disadvantages of prior devices and provides means enabling exact positioning of the accounting or like sheet in the running-in device. In carrying out the invention pairs of running-in rollers and at least two spaced electrical contacts are so arranged that the respective sheet will actuate the contacts only if the sheet is disposed in a desired position to effectuate running-in movement relative to said feed inlet. Due to the employment of electrical contacts, the perforations heretofore used in sheets of this type can be eliminated and sheets of any type or shape or formation may be employed.

It is a further object of the invention to provide means contributing to a regulated feed of the respective sheet or sheets, whose weight actuates mechanical means of any type to release a sheet or to bring about its running-in movement.

It is another object of the invention to provide means facilitating a self-cleaning action of the electrical contacts during the passage or sliding movement of a sheet past said contacts.

It is suitable that the contacts are in the form of springs which abut against a respective electrically conductive surface of rotatable rolls or rollers, contact the latter and are so disposed that the sheet upon being

thrown into the funnel-shaped inlet will separate the springs and the electrically conductive surfaces with which said springs cooperate.

The employment of springs ensures actuation of the contacts already at very slight pressure. In all attachments of this type in which a motor is used for the running-in drive or discharge of the sheets the particular disposition of the contact springs has been found to be of particular importance. In accordance with the magnitude of the pressure with which the springs are pressed against the aforesaid conductive surfaces, a larger or smaller pressure is necessary to separate the respective engaged contact parts.

Thus it is possible to adjust the attachment in such a manner relative to the machine that solely the deposit of the sheet on the springs suffices to cancel out any effect and only after the sheet is forcibly thrown in, the respective contacts of the attachment will be actuated. Thus it will be avoided that during the discharge performance the sheet will again be automatically run in through motor operation. In order to adjust the attachment to all different types of sheets and carriers, the pressure of the springs against the respective contact surfaces may be easily adjusted and regulated by set screws and like devices.

In order to avoid damage to the sheet through the ends of the springs and in order to facilitate ready separation of the contacts, the aforesaid springs are so bent or shaped and positioned that the ends of the springs directed to the funnel-shaped inlet form an angle in regard to the direction of the feed of the sheet. In accordance with the practical requirements the contacts may be electrically connected in series in an open-circuit system or in parallel in a closed circuit system.

In accordance with the respective feed-in means suitable for a plurality of sheets or cards, a definite number of springs may be coordinated to each sheet or card. As a contact surface it is preferred to employ one of the transporting rolls which is then connected via a respective current-carrying contact with the mass or machine housing.

The aforesaid advantages, objects and other benefits will ensue from the following disclosure of one of many possible embodiments of the invention, which is illustrated in the attached drawing in which:

Fig. 1 shows principally in perspective a bookkeeping machine with a take-up attachment made according to the invention;

Fig. 2 shows on an enlarged scale a section taken along lines 2—2 of Fig. 1;

Fig. 3 is partly a fragmentary view and partly a perspective view of a take-up or running-in attachment, the funnel-shaped holder or inlet being omitted;

Fig. 4 shows a wiring diagram employable in the invention; and

Fig. 5 shows schematically a modification of a detail of the invention.

Referring now more particularly to the drawing, there is disclosed in Fig. 1 an accounting machine 1 with which is connected an attachment 2 embodying the invention. Attachment 2 is affixed to the carriage 3 of the aforesaid machine 1. This attachment 2 employs a feed device which carries different parts of a pulling-in mechanism hereinafter described in greater detail.

This latter mechanism comprises principally a transporting roller 4 and a guide roller 5 positioned forwardly of and normally in contact and coextensive with said roller 4. Roller 4 is keyed onto shaft 6 which is driven by a power source, such as an electro-motor 7, as more clearly shown in Fig. 4. Further fixed to shaft 6 and laterally spaced from roller 4 are two transport rolls 8, 8a. Shaft 6 is made of an electrically conductive material and the

lateral transport rolls **8**, **8***a* are electrically connected with shaft **6** and are also made from electrically conductive material. Each of these lateral transport rolls **8**, **8***a*, is connected via a respective sliding contact **9** (only one being shown in Fig. 4) with the mass or machine housing **10**. From respective intermediate support pieces or adapters **11** of electrically insulating material located on the machine housing **10** two springs **12**, **12***a* extend in such manner that they normally engage and slide on the lateral transport rolls **8**, **8***a*.

The pressure exerted on these rolls **8**, **8***a* may be readily regulated by means of adjustment screws **13**, as it is more clearly shown in Fig. 2. Springs **12**, **12***a* are electrically interconnected with each other and via a relay **14**, electromagnet or the like with a low-voltage power source or battery **15** to the ground or machine housing **10**. The switch **16** for relay **14** is constructed as a normally open contact blade, which lies in an electric circuit connected to motor **7**. As soon as the electrical connection between the springs **12**, **12***a* and the respective lateral transport rolls **8**, **8***a* is interrupted, relay **14** releases switch or contact blade **16** and causes closing of the motor circuit, as shown in Fig. 4, so that motor **7** will be set in motion and will drive roller **4** and lateral rolls **8**, **8***a*.

For the insertion or feed of one or more accounting sheets, cards or like carriers a funnel or hopper device **18** is provided which is defined by two walls **19** and **20**. From Fig. 3 the operation of the feed-in device will become quite clear.

If the sheet is in a position **21**, as indicated in dotted lines and reaches the funnel-shaped device **18** in over edge or oblique condition, then it will be supported at and engages with its leading edge a contact line extending between the transporting roll **8** and the guide roller **5** and thus in accordance with the degree of its slanting position causes first spring **12** to be removed or separated from the corresponding lateral transport roll **8**.

Since, however, the electrical connection via the other lateral transport roll **8***a* and its associated spring **12***a* remains intact, no take-in or run-in movement of the roller **4** and rolls **8**, **8***a* will be initiated. Only after the sheet or card assumes the position **17**, as shown in full lines in Fig. 3, and rollers **4** and **5** are engaged by said sheet **17** while the same extends with its leading edge in an exact horizontal position, both springs **12**, **12***a* will be forced away from the lateral transport rolls **8**, **8***a*, whereby the motor **7** will be included in the electric circuit and energized, as hereinabove referred to, so that rotation of roller **4**, with rolls **8**, **8***a* relative to roller **5** takes place and effectuates a desired feed-in or run-in movement for the sheet.

The springs **12**, **12***a* are so shaped and positioned that the free ends **22** of the respective springs form an angle with respect to the feed-in direction according to arrow **23** to effectuate guiding of the respective sheet in the funnel-shaped device **18** past said springs. According to this particular guiding movement, damage to the sheet **17** will be avoided and a desirable funnel-shaped feed device is attained.

Since according to the invention motor **7** effectuates besides the aforesaid running-in movement also the discharge-movement for said sheet, care must be taken that the sheet during its discharge will not cause a release of the spring contacts **12**, **12***a* and initiate again a running-in or feed-movement. As already stated, the pressure of the springs **12**, **12***a* is to be finely adjusted by set screws **13**.

According to this manner, only a sheet thrown in under force may release or open the contact condition between said springs **12**, **12***a* and rolls **8**, **8***a*, whereas a sheet which is solely placed thereon is not capable of effectuating said condition.

According to Fig. 5, the form of making contact may be readily changed and the lateral transporting rolls **8**, **8***a* may be made of electrically insulated material and the sliding contacts **9** to ground may be dispensed with. Upon inserting sheet **17** into funnel **18** springs **12**, **12***a* will be separated in a uniform manner from the lateral transporting rolls **8**, **8***a* and will thereby be pressed against fixed, but regulatable contact pieces **24** which are positioned opposite the lateral rolls **8**, **8***a*. These contact pieces **24** (only one being shown in Fig. 5) are grounded to the mass of the machine or machine housing **10**.

It is well understood that transport rolls **8**, **8***a* may be varied in regard to their positions relative to transport roller **4** in accordance with the width of the sheet or card to be supplied through the funnel **18**.

It is further to be remarked that the regulation of pressure of springs **12**, **12***a* depends upon the weight of the sheet and thickness thereof, and the distance of the springs **12**, **12***a* relative to the transport rolls **8**, **8***a* may be regulated, so that these springs may be highly sensitive or not depending upon the weight, thickness and width of the sheets or cards used.

It can thus be seen that there has been provided in accordance with the present invention a feed-in mechanism for a sheet, card and similar plate-shaped carrier for use in connection with bookkeeping and like machines; comprising funnel means for inserting said sheet into said mechanism, transport roller means including contact roll means, guide roller means in operative connection with said transport roller means and arranged forwardly of said transport roller means and beneath said funnel means, spring-actuated electric contact means cooperable with said contact roll means and adapted to be spaced from the latter upon accurate insertion of said sheet in said funnel means and against said spring-actuated contact means, a first electric circuit including a switch blade and a power drive operatively connected to said transport roller means and said contact roll means for imparting rotation to the latter and to said transport roller means, a second electric circuit including said electric contact means, and means in said second circuit for operating said switch blade in said first circuit, whereby upon displacement of said contact means from said contact roll means following correct insertion of said sheet in said funnel means and against said spring-actuated contact means said second circuit is interrupted and causes operation of said switch blade in said first circuit to connect said power drive with said transport roller means.

Various changes and modifications may be made without departing from the spirit and scope of the present invention and it is intended that such obvious changes and modifications be embraced by the annexed claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A feed-in mechanism for a sheet, card and similar plate-shaped carrier for use in connection with bookkeeping and like machines; comprising funnel means for feeding said sheet into said mechanism, transport roller means, guide roller means in operative connection with said transport roller means and arranged beneath said funnel means, spring-actuated electric contact means cooperable with at least some of said transport roller means and adapted to be spaced from the latter upon accurate insertion of said sheet in said funnel means and against said spring-actuated contact means, a first electric circuit including a switch blade and a power drive for rotating said transport roller means, a second electric circuit in which said electric contact means are included, and means in said second circuit for operating said switch blade in said first circuit and imparting rotation to said transport roller means by said power drive upon displacement of said contact means from said transport roller means thereby causing said second circuit to operate said switch blade in said first circuit.

2. A feed-in mechanism for a sheet, card and similar plate-shaped carrier for use in connection with bookkeeping and like machines; comprising funnel means for inserting said sheet into said mechanism, transport roller

means including contact roll means, guide roller means in operative connection with said transport roller means and arranged forwardly of said transport roller means and beneath said funnel means, spring-actuated electric contact means cooperable with said contact roll means and adapted to be spaced from the latter upon accurate insertion of said sheet in said funnel means and against said spring-actuated contact means, a first electric circuit including a switch blade and a power drive operatively connected to said transport roller means and said contact roll means for imparting rotation to the latter and to said transport roller means, a second electric circuit including said electric contact means, and means in said second circuit for operating said switch blade in said first circuit, whereby upon displacement of said contact means from said contact roll means following correct insertion of said sheet in said funnel means and against said spring-actuated contact means said second circuit is interrupted and causes operation of said switch blade in said first circuit to actuate said power drive to operate said transport roller means.

3. A mechanism according to claim 2, said spring-actuated contact means and said contact roll means being made of electric current conductive material, said contact roll means being laterally spaced from said transport roller means and being located on a common shaft, said shaft being operatively connected with said power drive in said first circuit.

4. A mechanism according to claim 3, including means for regulating the pressure of said spring-actuated contact means relative to said contact roll means, whereby said sheet upon being fed through said funnel means is enabled through its leading edge to space said spring-actuated electric contact means from said corresponding contact roll means.

5. A mechanism according to claim 2, including means placed in said second circuit and forming abutment means against said spring-actuated electric contact means when the latter are separated from said contact roll means upon insertion of said sheet into said mechanism and against said spring-actuated contact means.

6. A mechanism according to claim 3, said spring-actuated electric contact means terminating each in a bent end forming an angle with said sheet when the same is inserted into said funnel means, to thereby prevent damage of said sheet by said spring-actuated contact means.

7. A mechanism according to claim 2, said second circuit including a low-voltage power source, said switch blade operating means being in the form of a relay connected in series with said low-voltage power source.

8. A feed-in mechanism for a sheet, card and similar plate-shaped carrier for use in connection with bookkeeping, computing and like machines; comprising funnel-shaped means for supplying said sheet to said mechanism, centrally located transport roller means, spaced apart contact roll means located laterally of said transport roller means, guide roller means in operative connection with said transport roller means and arranged forwardly of said transport roller means and beneath said funnel means, a drive shaft common to and supporting said transport roller means and said contact roll means, spring-pressed electric contact means normally abutting said contact roll means and adapted to be spaced from the latter upon accurate insertion of said sheet therebetween, means for regulating the pressure of said contact means against said roll means, a first electric circuit including a switch blade and a motor operatively connected to said drive shaft to rotate said transport roller means and said contact roll means and through the said transport roller means said guide roller means, and a second electric circuit including a power source, said electric contact means and operable means for actuating said switch blade in said first circuit, whereby upon spacing said contact means from said contact roll means following correct insertion of said sheet against said spring-pressed contact means said switch blade in said first circuit will be operated to close said first circuit via said motor for rotating said transport roller means and through the latter said guide roller means for pulling said sheet into said mechanism.

9. A feed-in mechanism for use in connection with a business machine; comprising funnel-shaped means for supplying a sheet into said mechanism, centrally located transport roller means including spaced apart contact roll means located laterally of said transport roller means, a guide roller in operative connection with said transport roller means and arranged forwardly of said transport roller means and beneath said funnel-shaped means, electrical contact switch means cooperable with said contact roll means and adapted to be operated upon accurate insertion of said sheet in said funnel-shaped means and against said switch means, a first electric circuit including a switch blade and a motor, said motor being drivingly connected to said transport roller means and said contact roll means for rotation thereof, and a second electric circuit including said contact switch means and further including a power source and electromagnetic means for actuating said switch blade in said first circuit so that upon actuation of said contact switch means following correct insertion of a sheet in said funnel-shaped means said power source will be connected to said motor for operating said motor to rotate said transport roller means and said contact roll means.

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