

May 13, 1958

A. PEREZ ET AL

2,834,316

AUTOMATIC MICRO GUIDE FOR DUPLICATING MACHINES

Filed Oct. 29, 1956

2 Sheets-Sheet 1

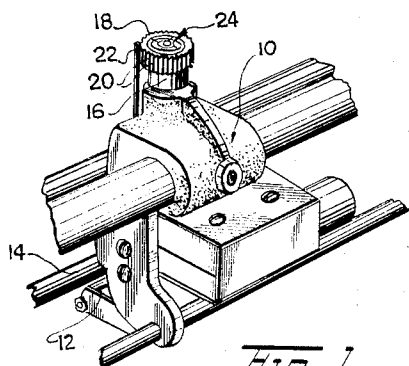


Fig. 1.

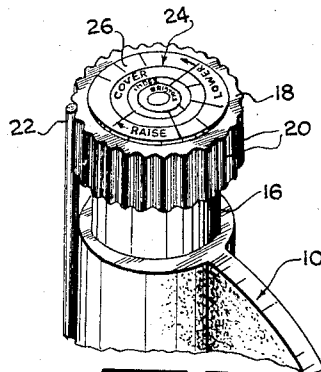


Fig. 2.

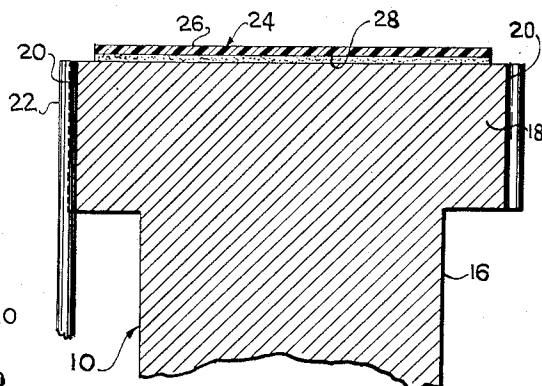


Fig. 4.

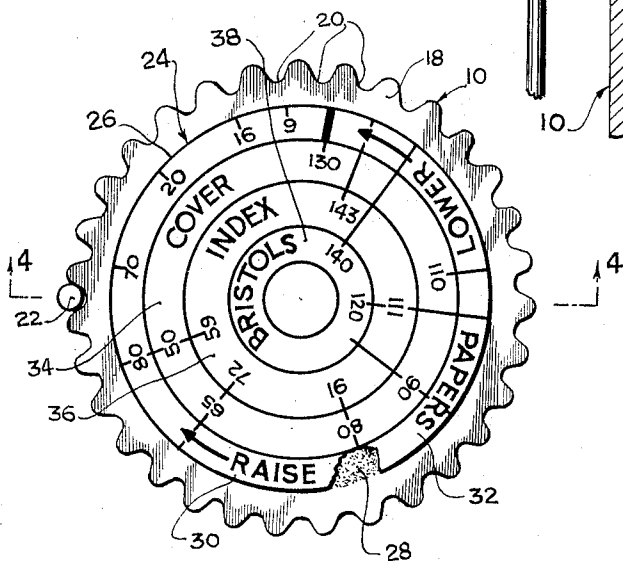


Fig. 5.

INVENTORS
ANTHONY PEREZ
WILLIAM GOLDSBOROUGH
BY *John H. Polach*
ATTORNEY

May 13, 1958

A. PEREZ ET AL

2,834,316

AUTOMATIC MICRO GUIDE FOR DUPLICATING MACHINES

Filed Oct. 29, 1956

2 Sheets-Sheet 2

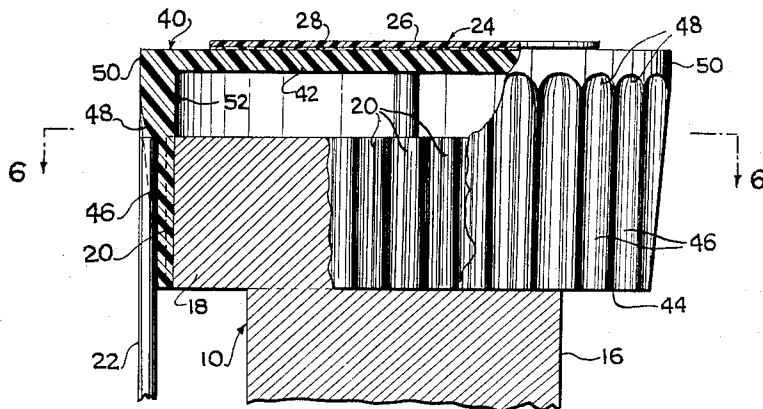


Fig. 5.

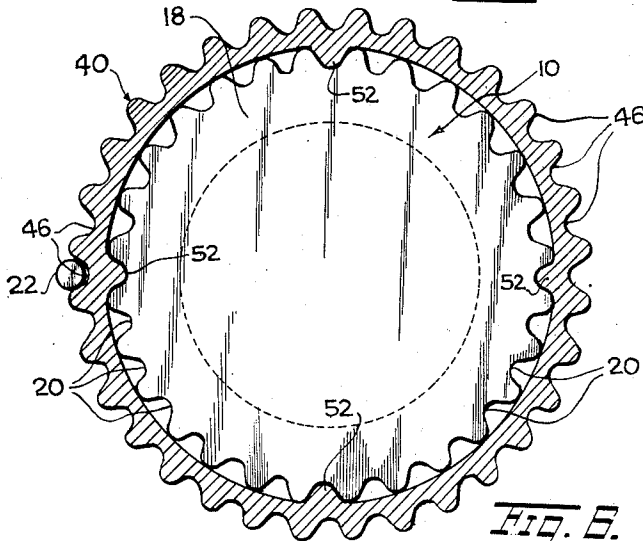


Fig. 6.

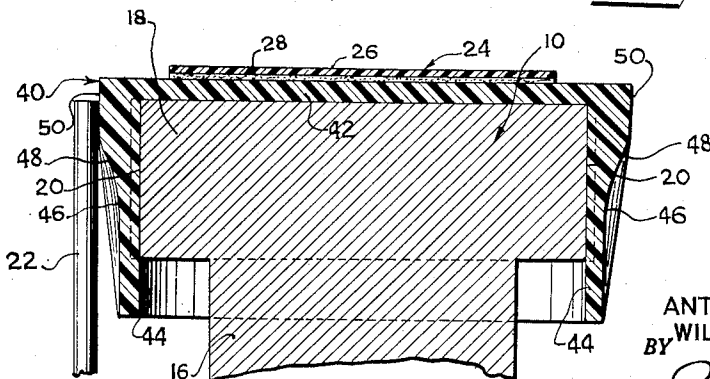


Fig. 7.

INVENTORS
ANTHONY PEREZ
BY WILLIAM GOLDSBOROUGH

William Goldsborough
ATTORNEY

1

2,834,316

AUTOMATIC MICRO GUIDE FOR DUPLICATING MACHINES

Anthony Perez, New York, and William Goldsborough, Babylon, N. Y., assignors to Elliot Mandel, New York, N. Y.

Application October 29, 1956, Serial No. 618,885

3 Claims. (Cl. 116—133)

The present invention relates in general to duplicating machines, used in reproducing, in quantity, printed material. More particularly, the invention refers to an improvement in the multiple sheet detector or micro-guide of the duplicating machine manufactured by the Addressograph-Multigraph Corporation, 1200 Babbitt Road, Cleveland 17, Ohio, which machine bears the trademark "Multilith," and is known as Model 1250 in the line of machines manufactured by the designated corporation.

The multiple sheet detector of the designated machine has the purpose of preventing more than one sheet of paper or other material on which the printing is to be placed, from passing along the conveyor board and into the duplicator. Said detector is electrically actuated and is controlled by sheets passing between a small detector roll and the lower pullout roller of the machine. When properly adjusted, the detector will permit single sheets to pass between said roll and roller, but two or more sheets will be deflected by a suitably located deflector into the catcher pan below the conveyor board.

The adjustment of the multiple sheet detector is effected by means of a notched knob which rotates, and is disposed for manual operation by the worker. Engaged in a selected notch of the knob is an upwardly projecting detent in the form of a rod of spring material, tensioned to engage firmly against the notched periphery of the roller. The roller is marked "raise" and "lower," with oppositely extending arrows being associated with these respective legends. If the knob is turned in the direction marked "raise," the detector roll and lower pullout roller will be shifted relative to one another to increase the space therebetween, and if the knob is turned in the opposite direction, that is, the direction marked "lower," said space is reduced.

By rotation of the knob to selected locations, the multiple sheet detector is accurately disposed for permitting single sheets of any desired weight to pass therethrough, such as for example, sixteen pound paper, twenty pound paper, Bristol board, etc.

Difficulty has been experienced in effecting accurate settings of the knob, since the only legends carried thereby are those indicated above. One is required to inspect the exact adjustment of the knob, to ascertain what weight paper will pass between the detector roll and lower pullout roller, and thereafter one must in effect employ guesswork to determine to what extent the knob should be rotated for the purpose of handling a particular weight or thickness of paper. Since any of a large number of different thicknesses can be handled by the same machine, it becomes apparent that it is exceedingly difficult to effect the desired adjustments in the knob, without at the same time making continuous checks to determine to what extent the space between the mentioned roll and roller has been increased or narrowed. Such a calculation must be made by placing sheets between the rollers, and obviously, this is a relatively inconvenient process, involving, so to speak, edu-

2

cated guesses or maximum familiarity and skill in operating the machine, before the desired adjustment is finally achieved.

In view of the difficulties which have heretofore persisted, the main object of the present invention is to provide means attachable to the knob of the multiple sheet detector, which will be designed to automatically show the exact extent to which the knob should be rotated, for handling paper of different weights, so that all guesswork will be completely eliminated, as well as the necessity of trying the adjustment to determine if it has been properly established. It is proposed, in carrying out the invention, to so design the attachment to the knob that one will have, on the surface of the knob, every adjustment to which it may be desired to rotatably move the knob, with the detent serving as an index registrable with any of the various indicia marked upon the attachment.

Another object is to provide an attachment of the character described that will include thereon markings covering not only the several weights of paper that are ordinarily handled in a duplicating machine of the type described, but also other markings indicating various weights of cover stock, index stock, and Bristol board, the full range of indicia thus permitting setting of the knob for handling any of the types of stock ordinarily placed in a machine of the character described, and any of the weights in which the various types of stock are classified.

A further object of importance is to provide an attachment of the character described that will be exceedingly inexpensive, and will be swiftly mountable upon a control knob of a machine of the character specified, without requiring any modification or redesign whatever of the knob or of any other component of the multiple sheet detector, the device thus being readily adaptable for attachment to machines already in use.

Another object is to provide, in another form of the invention, an attachment for the control knob which will be so designed as to be connectable to the knob merely by being positioned thereon, with the device then being itself adjustable in a direction axially of the knob in a manner that will permit rotation of the knob to a selected position of adjustment without the detent moving into and out of notches, the device then being axially shiftable upon the knob after the rotatable adjustment has been effected, for the purpose of locating the detent in a notch. The device, in this form of the invention, eliminates the ratcheting action of the detent on the knob, which action inhibits the free rotational movement of the knob and slows and makes more difficult the entire process of effecting a change in the knob setting.

Still another object is to so design the device, in the second form thereof, that the indicia-marked attachment first mentioned will be a component part of the device, thus reducing the overall cost of manufacture of the invention, by permitting the indicia-marked attachment to be used either alone, or upon the knob-mounted element described.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a multiple sheet detector of a machine of the type specified, equipped with an automatic micro-guide according to the present invention.

Fig. 2 is an enlarged, fragmentary, perspective view of the knob with the guide mounted thereon.

3

Fig. 3 is a top plan view, still further enlarged, of the knob and of the guide, a portion of the guide being broken away.

Fig. 4 is a sectional view substantially on line 4—4 of Fig. 3, on the same scale as Fig. 3.

Fig. 5 is a view of a modified form of the device mounted upon the control knob, the control knob and the attachment being shown partly in section and partly in elevation.

Fig. 6 is a plan sectional view substantially on line 6—6 of Fig. 5.

Fig. 7 is a sectional view of the modified form of the device, shifted downwardly from its Fig. 5 position to move the detent out of the notches and permit free rotational movement of the knob and of the device.

Referring to the drawings in detail, in Figs. 1—4 there is illustrated a multiple sheet detector of a machine of the type hereinbefore specified. Said detector has been generally designated at 10 in Fig. 1, and being a mechanism already in use, need not be described in full detail herein. It is sufficient to note, for the purposes of the present invention, that the detector 10 includes a small detector roll 12 located in closely spaced, parallel relation to the lower pullout roller 14 of the machine. The detector further includes an upwardly projecting shaft 16 to the upper end of which is rigidly connected a knob 18 having a peripheral series of notches 20 in any of which a detent 22 of springable material is adapted to engage, according to rotational adjustment of the knob to a selected position. By rotation of the knob in one direction, the detector roll 12 is moved away from the lower pullout roller 14. Rotation of the knob in the opposite direction moves the detector roll 12 toward the lower pullout roller 14.

When the space between the roll and roller is reduced to a minimum, the adjustment will handle sixteen pound paper, and a single sheet of paper of this weight will pass between the roll and roller. If a plurality of sheets somehow begins movement between the roll and roller, they will be deflected by a deflector, not shown, into a catcher pan, also not shown.

Conventionally, the knob 18 is marked with the word "raise," adjacent an arrow extending in one direction, and the word "lower" adjacent an arrow extending in the opposite direction. Thus, clockwise rotation of the knob moves the detector roll away from the pullout roller, while counterclockwise rotation, in the direction marked "lower," causes the detector roll to move toward the lower pullout roller 14.

As previously mentioned herein, the provision of no more than these indicia upon the knob involves the necessity of making the desired knob setting in a relatively haphazard manner, and the worker is required to spend considerable effort in changing the knob settings, particularly where a substantial change is involved, as for example when the machine is being adjusted from a setting permitting the printing of sixteen pound paper, to a setting involving the printing of heavy stock, such as Bristol board of substantial weight.

In accordance with the present invention, there is provided an attachment for the knob, generally designated 24, providing an automatic micro-guide that will permit rotatable adjustment of the knob to desired settings swiftly, easily, accurately, and without requirement for trying the adjustment to determine if the spacing between the roll 12 and the lower pullout roller 14 is proper. In Figs. 1—4, the device constitutes a flat, circular plate 26 which may be formed of flexible, thin plastic material, and which is adhesively secured as at 28 to the face of the knob, in concentric relation to the knob. Plate 26 is of a diameter slightly less than that of the knob, so as not to extend into the notches 20.

The proper placement of the plate upon the knob can of course be readily effected, initially, by locating sheets of particular weights between the roll and the pullout

4

roller. It is, in fact, actually necessary to locate only one sheet therebetween, and thereafter, the plate 26 may be turned upon the face of the knob before being adhesively connected thereto, until the indicium on the plate corresponding to the weight of the stock disposed between the roll 12 and pullout roller 14 is in registration with the detent 22. Then, the plate is permanently secured by adhesive means to the knob, and the device is ready for use.

In this connection, referring to Fig. 3 it will be noted that imprinted upon the plate 26 are concentric rings, forming correspondingly concentric, annular subdivisions of the surface of the plate. The outermost annular division of the plate is marked with the legends "raise" and "lower" with arrows extending in opposite directions from the respective legends, thus showing the direction in which the knob should be turned for increasing or decreasing the space between the roll and the roller, whichever is desired. The outermost subdivision also has the word "papers" as shown at 32, signifying that the indicia in the outermost annular subdivision represent different weights of paper stock. Thus, in the outermost ring or subdivision of the plate, there are the numerical indicia "9," "16," "20," etc., in ascending order, these being the conventional weights of paper stock, indicating nine pound stock, sixteen pound stock, etc.

The next annular space 34 is marked with the indicium "cover" indicating cover stock, and bears at angularly spaced locations, in ascending order of value, the various weights of cover stock, such as "50," "65," etc. It may be noted that from each indicium of any annular subdivision, a radial line marking extends to the periphery of the plate, so that any indicium, even one on the innermost ring, can be readily registered with the detent 22.

The next space 36 is marked "index" and again has numerical indicia in ascending order of value angularly spaced thereabout, designating the weights of index stock. Thus, there are the indicia "59," "72," "91," etc.

The innermost ring is for the heaviest stock, and is marked "bristols" and bears the indicia "100," "120" and "140."

It will be seen that in a direction inwardly from the periphery of the plate, the annular subdivisions of the plate are employed for bearing indicia designating progressively heavier stock, so that the device provides a guide for setting of the knob, which guide will cover the full range of stock handled by the machine.

Assuming, for example, that with the device set in the position shown in Fig. 3, a change in the setting of the machine is desired, so that single sheets of eighty pound paper stock may pass between the detector roll 12 and the lower pullout roller 14, the knob will be turned clockwise in Fig. 3 until the indicium "80" in the outermost circle or ring is registered with the detent 22. The detent 22 will snap into the notch that is radially aligned with the indicium "80" and the detector is thus adjusted for handling eighty pound paper stock. There is no necessity of trying out the adjustment, or of making a visual inspection to determine whether the knob must be turned in a direction to raise or lower, and as a result, the change in the knob setting is effected swiftly and easily, with the desirable result that "down time" of the machine is reduced to a minimum. The speed with which adjustments can be effected, as will be apparent, results in the machine being out of operation for shorter periods of time than has heretofore been the case, so that the cost of the device in effect is swiftly amortized, with the device thereafter increasing, over a period of time, the profits derived from operation of the machine.

In Figs. 5—7 there is shown a form of the device which does not require cementing of the plate 24 directly to the knob 18. The form shown in these figures of the drawing has the further desirable characteristic that while the knob is being rotated for the purpose of changing the setting, the detent 22 travels over a smooth-surfaced,

5

rather than a notched portion of the device, so that the rotation of the knob is effected freely and without the ratcheting action of the detent into and out of notches such as occurs in the multiple sheet detector as conventionally constructed. At the same time, the form shown in Figs. 5-7 has the desirable characteristic that it is applicable to a conventional multiple sheet detector 10 without requiring any modification or redesign whatever of said detector.

In this form of the invention, the device has been generally designated at 40, and includes a circular, flat plate 42 integrally formed with a depending, peripheral flange or skirt 44, the outer surface of which has notches 46 extending parallel to the axis of rotation of the knob 18. The notches 46 correspond in number and spacing to the notches 20 of the conventional knob 18, and as will be noted, exteriorly the flange or skirt 44 tapers slightly in a downward direction (see Figs. 5 and 7) for a purpose to be made more clearly apparent hereinafter. The notches 46, at their upper ends, terminate short of the top face of the plate 42, merging smoothly into a smooth-surfaced portion 50 of the skirt through the provision of gently sloped cam surfaces 48 that lie obliquely to the axis of rotation of the knob 18. The exterior tapering of the skirt in a downward direction, further, reduces the depth of the notches 46 gradually in a direction away from the smooth-surfaced portion 50 of the device.

The device is thus of inverted cup shape, and referring now to Figs. 5 and 6, on the inner surface of the skirt there are provided ribs 52 extending parallel to the axis of rotation of the knob, and extending fully from the plate 42 to the lower edge of the skirt. The ribs 52 are angularly spaced ninety degrees apart in the present embodiment, but this spacing can vary, as can also the number of the ribs. It is mainly important that the ribs be adapted to fit into the notches 20 of the conventional knob 18, and that they be free to slide in the direction of their lengths within the notches 20. It is also mainly important that the ribs be so spaced and be of such a number that when engaged in the notches 20, they will connect the cup-shaped knob cover 40 to the knob, for rotation conjointly with the knob.

To the top surface of the plate 42, there is adhesively connected at 28 the plate 26 of the indicia-marked guide 24 illustrated in detail in Figs. 1-4.

It will be noted that in this form of the invention, the device is applicable to the knob 18 merely by manually holding the detent 22 outwardly from the knob a short distance, and then moving the knob cover 40 downwardly into a position receiving and enclosing the knob 18. The knob cover will, of course, first be so positioned that the indicia shown in Fig. 3 will be properly located relative to the lower pullout roller and the small detector roll.

In any event, with the cover properly positioned and the detent 22 held outwardly in the manner described, the cover is moved downwardly, with ribs 52 sliding within those notches 20 of the cover 18 that are in registration with the ribs. This connects the cover to the knob for rotation therewith and the cover is left permanently upon the knob.

When it is desired to effect a change in the knob setting, the device is shifted downwardly to its Fig. 7 position, with the plate 42 bearing against the top surface of the knob 18. This will cause the free end of the detent 22 to ride up on the cam surface 48 of the particular notch 46 in which it has been engaged, so that the detent is moved out of said notch 46 as shown in Fig. 7, and is in contact only with the smooth-surfaced portion 50 of the knob cover. The knob cover is now grasped and turned to the desired adjusted setting, causing the knob 18 to be turned therewith. The rotation, as will be observed, is effected freely and without ratcheting of the detent 22 into and out of notches 46.

When the knob cover and knob have been conjointly rotated to the desired position, the knob cover is merely

6

pulled upwardly, from its Fig. 7 to its Fig. 5 position. This causes the detent to ride down upon the cam surface of the particular notch 46 with which it will have been registered, causing the detent to now engage in said notch 46 to preserve the setting. On the next occasion on which a change of setting is necessary, the knob cover is shifted downwardly from its Fig. 5 to its Fig. 7 position once again and the cover turned in a selected direction, again with the detent automatically positioned on the smooth portion 50 to permit free rotation of the cover and knob.

It will be apparent that in this form of the invention, the plate 26 would be adhesively secured to the knob cover during manufacture, and the entire device would be sold as a unit for application to a conventional knob 18.

It is to be understood that our device may also be used on other machines, such as collating machines and the like.

While we have illustrated and described the preferred embodiments of our invention, it is to be understood that we do not limit ourselves to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described our invention, what we claim as new and desire to secure by United States Letters Patent is:

1. In a multiple sheet detector of a duplicating machine the combination, with a detector setting knob having a peripheral series of notches, and with a detent pin engageable in any selected notch of said series, of means attachable to said knob having indicia designating different weights of stock to be fed through said detector, said indicia being selectively registrable with the detent pin responsive to rotation of the knob for selection of different knob settings corresponding to the weights of the stock fed through the detector, said means comprising a plate element of inverted cup shape including a flat, circular plate portion overlying the knob and a depending, peripheral skirt having an external series of notches extending in parallelism with the axis of rotation of the knob, said element including means on the inner surface of the skirt lockably engageable with selected notches of the knob for connecting the cup-shaped element and knob together for conjoint rotation, the notches of the skirt being adapted for engagement of said detent pins therein, said means on the inner surface of the skirt comprising angularly spaced ribs extending in parallelism with the axis of rotation of the knob, said ribs being slidably engaged in the notches of the knob, for axial adjustment of the cup-shaped element relative to the knob, said notches of the skirt terminating short of the plate portion to define a smooth-surfaced portion on the skirt against which the detent pin engages in a selected position of axial adjustment of the cup-shaped element, to permit free rotational movement of the cup-shaped element and knob between selected settings of the knob.

2. In a multiple sheet detector of a duplicating machine the combination, with a detector setting knob having a peripheral series of notches, and with a detent pin engageable in any selected notch of said series, of means attachable to said knob having indicia designating different weights of stock to be fed through said detector, said indicia being selectively registrable with the detent pin responsive to rotation of the knob for selection of different knob settings corresponding to the weights of the stock fed through the detector, said means comprising a plate element of inverted cup shape including a flat, circular plate portion overlying the knob and a depending, peripheral skirt having an external series of notches extending in parallelism with the axis of rotation of the knob, said element including means on the inner surface of the skirt lockably engageable with selected notches of the knob for connecting the cup-shaped element and knob together for conjoint rotation, the notches of the skirt

being adapted for engagement of said detent pins therein, said means on the inner surface of the skirt comprising angularly spaced ribs extending in parallelism with the axis of rotation of the knob, said ribs being slidably engaged in the notches of the knob, for axial adjustment of the cup-shaped element relative to the knob, said notches of the skirt terminating short of the plate portion to define a smooth-surfaced portion on the skirt against which the detent pin engages in a selected position of axial adjustment of the cup-shaped element, to permit free rotational movement of the cup-shaped element and knob between selected settings of the knob, said notches of the skirt, at the ends thereof adjacent the smooth-surfaced portion, being formed with sloping end walls merging into the smooth-surfaced portion to define cam surfaces adapted to bias the detent pin outwardly of the notches onto the smooth-surfaced portion.

3. In a multiple sheet detector of a duplicating machine the combination, with a detector setting knob having a peripheral series of notches, and with a detent pin engageable in any selected notch of said series, of means attachable to said knob having indicia designating different weights of stock to be fed through said detector, said indicia being selectively registrable with the detent pin responsive to rotation of the knob for selection of different knob settings corresponding to the weights of the stock fed through the detector, said means comprising a plate element of inverted cup shape including a flat, circular plate portion overlying the knob and a depending, peripheral skirt having an external series of notches extending in parallelism with the axis of rotation of the knob, said element including means on the inner

surface of the skirt lockably engageable with selected notches of the knob for connecting the cup-shaped element and knob together for conjoint rotation, the notches of the skirt being adapted for engagement of said detent pins therein, said means on the inner surface of the skirt comprising angularly spaced ribs extending in parallelism with the axis of rotation of the knob, said ribs being slidably engaged in the notches of the knob, for axial adjustment of the cup-shaped element relative to the knob, said notches of the skirt terminating short of the plate portion to define a smooth-surfaced portion on the skirt against which the detent pin engages in a selected position of axial adjustment of the cup-shaped element, to permit free rotational movement of the cup-shaped element and knob between selected settings of the knob, said notches of the skirt, at the ends thereof adjacent the smooth-surfaced portion, being formed with sloping end walls merging into the smooth-surfaced portion to define cam surfaces adapted to bias the detent pin outwardly of the notches onto the smooth-surfaced portion, said skirt being externally tapered to reduce the depth of the notches thereof in a direction away from the smooth-surfaced portion of the skirt, whereby to permit the detent pin to be biased fully out of the notches responsive to said axial adjustment of the cup-shaped element in one direction.

References Cited in the file of this patent

UNITED STATES PATENTS

1,185,467	Beauchamp	May 30, 1916
2,233,153	Welk	Feb. 25, 1941
2,245,214	Mihalyi	June 10, 1941