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Courier Press, Leamington Spa, England.

Description

The present invention relates to a fluid metering apparatus according to the preamble of Claim 1, and particularly to an ink key control system.

To produce high quality printed matter, it is essential that ink be consistently delivered in a carefully controlled manner for deposition upon the paper or other stock in the printing operation. A number of factors involved in the printing process directly influence the application of the ink to the paper and thus the resulting appearance of the finished product. For example, the composition, texture and finish of the paper stock or other material to be printed, the color, composition and consistency of the ink, the type of ink roll being used, and the nature of the printed image itself are among the factors involved. For any particular set of operating conditions there is, however, an optimum profile of ink film thickness across the ink roll which is preferably created and maintained as the printing operation proceeds.

To control the thickness of the layer or film of ink on the ink roll and create areas of differing thicknesses as desired along the length of the roll, printing presses are conventionally provided with an ink fountain having a flexible blade in close proximity to the ink roll. As disclosed in U.S. Patent No. 4,008,664, the spacing of the flexible blade from the ink roll is adjustable at a plurality of lateral locations along the roll to thereby control the amount of ink flowing from the fountain onto the rotating ink roll through the gap therebetween in corresponding zones spaced along the roll. A plurality of rotary adjusting devices, or keys, are provided along the fountain, with means bearing against the blade at the various locations to maintain and adjust the position of the blade relative to the roll in response to rotation of the individual keys, and thereby to control the thickness profile of the ink layer.

The keys may be operated manually by turning a knurled head in response to a perceived visual need to vary the thickness of the ink layer in a particular area. Likewise, as disclosed in the aforementioned U.S. Patent No. 4,008,644, each key might be provided with a bidirectional motor operated manually from a remote location or, for example, operated in response to signals from a sensor scanning the plate for ink coverage or from a color sensor scanning the printed material.

Another ink adjusting mechanism is disclosed in U.S. Patent No. 3,134,325. This mechanism has a flexible blade extending along the length of a fountain roll for controlling the amount of ink on said roll, an ink adjusting mechanism for flexing the blade at specified portions comprising: (a) reversible endless belt drive means; (b) a plurality of rotatable screw means positioned along the length of said blade being operatively associated with portions of said blade to vary the flexture thereof; and (c) a plurality of selectively controlled clutch means with each such clutch means operatively connecting one of said screw means with said endless belt drive means. Each of said clutch means has a drive portion in continuous contact with said drive means and a driven portion in intermittent contact with said screw means whereby said drive means may rotate one or more screw means at one time to selectively flex portions of said blade.

Another system for adjusting the keys, which is disclosed in U.S. Patent No. 3,353,484 and is the closest prior art, includes a travelling carriage with a relatively complex arrangement of clutches and gears for meshing with gear teeth on the keys and thereby selectively rotating the keys a slight amount upon passing in one or the other direction. In particular, this system comprises the functional elements described in the preamble of Claim 1.

The present invention relates to a fluid metering apparatus according to said preamble of Claim 1.

It is an object of the invention to provide an improved and simple system of this type which is cost-efficient in construction and maintenance, for remotely controlling the ink keys of a printing press and for sensing the position of the keys, employing a single actuator for the entire fountain of keys, thus avoiding the complexity of the prior art systems and particularly the need for intermeshing gears and clutches.

For this purpose, the fluid metering apparatus of the invention is characterized by the features defined in Claim 1, Further characteristics are contained in Claims 2 to 8.

The apparatus of the present invention particularly enables the actuation and sensing of ink keys which are closely spaced in a straight line by means of a single key actuator which is synchronized with its movement along and into engagement with each key of a plurality of keys so as to adjust only those keys requiring adjustment.

Other objects and advantages will become more apparent upon a reading of the following description of preferred embodiments of the invention made with reference to the accompanying drawings.

Brief Description of the Drawings

In the drawings, wherein like numerals are employed to designate like parts throughout the same:

Fig. 1 is a plan view, with the fountain base pivoted to the horizontal position, showing the positioning unit, key actuator and ink fountain keys of a printing press employing one embodiment of the invention;

Fig. 2 is a plan view of the drive unit for the positioning unit or carriage;

Fig. 3 is an end elevation, partially in section, of the apparatus of Fig. 1 and including the ink fountain and ink roll;

Fig. 4 is a fragmentary plan view taken substantially along line 4—4 of Fig. 3;

Fig. 5 is an end elevation, partially in section, illustrating another embodiment of the invention;

Fig. 6 is a fragmentary view, partially in section, taken substantially along line 6—6 of Fig. 5; and

Fig. 7 is a fragmentary plan view of the embodiment of Fig. 5, with the fountain base pivoted downwardly to a horizontal position.

Description of the Preferred Embodiments

Referring now to the drawings, there is shown generally at 10 in Fig. 1 a mechanism for adjusting the keys which regulate the flow of ink from the fountain to the ink roll of a conventional printing press, symbolically shown by the box 11. More particularly, and as further shown in Fig. 3, the system includes a travelling carriage or positioning unit 12 upon which is mounted a key actuating unit 13 for engaging and selectively rotating the individual rotating keys of a console 14 of such keys as the carriage is caused to traverse back and forth along the console in either direction as indicated by the arrow 15.

As will be readily apparent in Fig. 3, the inking system of the printing press 11 within which the key adjusting mechanism is incorporated includes an ink fountain 16 and associated ink roll 17 extending laterally across the width of the press in the conventional manner. The ink fountain comprises a base 18 from which a flexible blade 19 is suspended with its lower edge 20 in close proximity to the ink roll 17. The flexible blade 19 and adjacent curved roll surface thus form a cavity within which is maintained a reservoir 21 of ink. During operation of the press, the ink roll 17 rotates in the direction indicated by the arrow 22, and ink from the reservoir 21 flows through the space between the lower edge 20 of the blade 19 and the roll 17 to create a film of ink upon the surface of the roll whose thickness is determined by the spacing of the blade edge from the roll surface at any point along its length. Thus, as is well known, by precisely controlling the profile of the edge 20 of the flexible blade, an ink film having a desired thickness profile can be maintained across the roll.

To that end, ink flow regulators or keys 23 are positioned at locations spaced laterally along the ink fountain 16. Each of the keys includes a barrel 24 threaded through the base 18, with a tip 25 projecting beyond the base to engage and support the rear of the flexible blade 19 adjacent the lower edge 20 thereof. Each section of the lower edge 20 is biased against its associated tip 25. Thus, by rotating the threaded barrel 24 of a selected key, the tip 25 of the selected key may be advanced or retracted as desired to thereby control the spacing between the edge 20 of the associated section of the blade and the adjacent surface of the roll 17.

While the keys may obviously be manually adjusted as required, present day printing technology makes remote automatic adjustment of the keys highly desirable. In the aforementioned U.S. Patent No. 4,008,644 it is suggested that each key might be provided with a small bidirectional motor for this purpose. While such a system is entirely satisfactory, there are certain advantages in being able to employ a single actuating unit for adjusting all of the keys. Thus, in the present device, the barrel 24 of each of the keys 23 extend rearwardly from the base 18 and has affixed thereto a friction wheel 26 by means of which the key is rotated by the key actuating unit 13 as will be hereinafter described. To permit manual adjustment of the keys at such times as necessary, each barrel 24 may have at its outer end a knurled hand wheel 27.

The carriage or positioning unit 12 is supported upon a framework carried by the press 11 and includes a spaced pair of parallel track members 28 extending between supports 29 at either side of the press. A base plate 30 is mounted upon the track members 28 by bearing blocks 31 such as ball bushings so as to be readily movable back and forth along the track members. Controlled movement of the carriage back and forth along the track may be provided by means of a perforated metal drive tape 32 affixed to the bearing blocks 31 as by studs 33. The drive tape is entrained around the drive sprocket 34 at one end of the framework and an idler wheel 35 at the other end. As will be apparent in Fig. 2, the drive sprocket is carried by the shaft of a stepping motor unit 36. To insure that movement of the carriage will be precisely timed by suitably controlling operation of the stepping motor drive unit, the drive sprocket includes teeth 37 which are received in mating perforations 38 in the drive tape 32.

The key actuating unit 12 is mounted upon the base plate 30 and includes a key positioning stepping motor 39 whose output shaft carries a pinion drum 40 provided with a surface 41 of a durable friction material. Also journalled upon a shaft 42 affixed to the base plate is a rotatable idler gear or wheel 43, likewise having a surface 44 of a durable friction material. The frictional surface 41 of the pinion drum 40 engages the frictional surface 44 of the idler gear 43, and consequently operation of the stepping motor causes rotation of the idler gear in a direction opposite that of the pinion drum.

As shown in Figs. 3 and 4, the keys 23 are closely spaced laterally across the ink fountain so as to permit precise positioning of the flexible blade in narrow segments across the ink roll 17. To achieve this relatively close spacing, it may be necessary to offset or stagger the position of alternate ones of the friction wheels 26 upon the barrels 24 of the keys. As will be apparent in Figs. 3 and 4, the planes of the adjacent offset friction wheels are closely spaced so that the idler gear 43 will be of sufficient width to engage one after another of the friction wheels in both rows as it is moved back and forth across the console 14 of keys by the carriage.

A position detector, shown generally at 45, is provided for monitoring the rotary positions of

the keys. A number of prior art devices are available which would be suitable for this purpose. By way of example and as shown in Figs. 3 and 4, one such device particularly well suited to this application is a so-called magnetic Hall effect transducer utilizing a multipolar ring magnet 46 affixed on the barrel 24 of each of the keys 23 behind the friction wheel 26. A sensor 47 is secured to the base plate 30 of the carriage so that when the key actuating unit 13 is in position to adjust the key, the sensor will be opposite the ring magnet of the key. The sensor will thus detect angular position or rotation of the key through the changing field of the rotating ring magnet and produce a signal representative of the angular position or amount by which the key is rotated. As will be apparent, a single sensor 47 will suffice for indicating the positions of the entire console 14 of keys.

There is shown in Figs. 5, 6 and 7 an alternate embodiment of the invention utilizing a somewhat different apparatus for mounting and driving the carriage or positioning unit. In other respects, it is substantially identical to the aforedescribed embodiment and, where appropriate, like numerals are used in identifying like parts.

As best shown in Fig. 5 a carriage or positioning unit, indicated generally at 48, is mounted upon the track members 28 so as to be movable back and forth therealong across the console 14 of keys. More particularly, the carriage comprises a box frame 49 slidably mounted upon the upper one of the track members by ball bushing supports 50 and upon the lower track member by yokes 51 affixed thereto. The carriage is moved along the rails by means of a drive mechanism including a splined shaft 52 extending across the press and journalled at the ends (not shown) as in the support members 29. The splined shaft is rotated in either direction in a controlled manner as by a stepping motor 53, mounted upon a bracket 54 affixed to the press framework supports 29, through meshing bevel gears 55 and 56 affixed to the output shaft of the stepping motor and the spline shaft, respectively.

A travelling helical gear 57 having a central aperture with mating slots for receiving the splines of the shaft 52 is journalled upon the splined shaft as by an appropriate ball bushing 58 so as to be freely movable along the shaft while being driven thereby. The travelling helical gear engages a mating gear 59 affixed to a shaft 60 journaled in bearings 61 carried by the box frame 49. Also affixed to the shaft 60 so as to rotate therewith is a pinion gear 62. The pinion gear engages a rack 63 affixed to and extending throughout the length of the fountain base 18. Thus, as will be readily appreciated, operation of the motor 53 will rotate the splined shaft 52 and the travelling helical gear 57 keyed thereto which, in turn, drives the mating gear 59. The shaft 60 thus rotates to drive the pinion gear 62 in meshing engagement with the rack 63 so that the carriage 48 is caused to move along the console 14 of ink keys on the track members 28. Since the teeth of the travelling helical gear 57 are intermeshed with the teeth of the mating gear 59, the travelling gear will move with the carriage 4a by sliding longitudinally along the splined shaft 52 on the ball bushing 58. It will be understood that by selectively operating the stepping motor 53 in either direction the carriage 12 may be caused to move back and forth across the console 14.

The key positioning stepping motor 39 of the key actuating unit 13 is mounted within the box frame 49, with the pinion drum 40 and idler wheel 43 in position whereby the idler wheel frictionally engages each of the friction wheels 26 in succession as the carriage moves back and forth across the console 14. Key position detector means 45 is provided by a multipolar ring magnet 46 affixed to the barrel 24 of each key and a sensor 47 carried by the box frame 49 so as to be adjacent the magnet of any particular key when the key actuating unit 13 is in position to adjust that key.

In both embodiments of the invention the entire key adjusting mechanism and ink fountain may be pivotally affixed to a shaft 64 carried by the press framework so that they may be swung downwardly from the operative position shown in Figs. 3 and 5 to a horizontal position for facilitating cleaning and maintenance of the ink fountain 16, ink roll 17 and flexible blade 19.

Briefly reviewing the operation of the invention and referring to the embodiments of Figs. 1 to 3, during a printing run the thickness profile of the ink supplied to the printed stock is monitored in a conventional manner, for example, as taught by the aforementioned U.S. Patent No, 4,008,664, or by a roving on-press color sensor or other suitable means. The resulting information may be utilized in a number of ways, the details of which are not part of the present invention, for controlling the key adjusting mechanism 10 of the invention. Thus, when it is determined that adjustment of the ink film thickness is required in one or more areas along the ink roll, the stepping motor drive unit 36 is instructed to move the carriage 12 from its present position to the key 23 controlling the ink film thickness in that area or zone. As the carriage moves, a signal is sent to the stepping motor 39 causing it to drive the idler wheel 43 at a peripheral speed and in the direction synchronized with the movement of the carriage so that as the idler wheel frictionally engages the friction wheel 26 of any key not requiring adjustment in moving therepast, it will merely roll over the friction wheel without causing it to rotate. When the adjusting mechanism encounters a key requiring adjustment, the stepping motor 39 will receive a command to rotate the friction wheel by a predetermined amount in the direction appropriate to retract or advance the tip 25 of the key to thereby increase or decrease the thickness of the ink film.

It is anticipated that the key adjusting mechanism of the invention may be controlled as by a microprocessor wherein programs are stored to establish predetermined ink thickness

profiles for different jobs that may be run on the press.

Claims

1. A fluid metering apparatus (10) comprising:

a fountain roll (17), means (19) for metering fluid on said fountain roll as said fountain roll rotates, said metering means including a flexible edge (20) juxtaposed to said fountain roll (17), a plurality of individually rotatable keys (23) adjustably contacting said flexible edge at spaced locations therealong, rotational position of each key controlling spacing between an associated section of said flexible edge (20) and said fountain roll (17), first drive means (32, 34, 35, 36), second drive means (39), a carriage (12), a drivable friction wheel (40, 41, 42, 43, 44),

each key (23) including a friction wheel (26) fixed thereto;

the carriage (12) being mounted for movement along said keys (23);

the first drive means (32, 34, 35, 36) controlling movement of said carriage (12); and

the drivable friction wheel (40, 41, 42, 43, 44) being carried by said carriage (12) and positioned to individually engage the friction wheel (26) of each key (23) as said carriage (12) moves therepast; characterized in that

the second drive means (39) rotates said drivable friction wheel (40, 41, 42, 43, 44) at (i) a speed and a direction synchronized with the movement of the carriage (12) when passing a key (23) not to be adjusted to roll over such key and (ii) a speed and direction when at a key to be adjusted to effect a desired spacing between the fountain roll (17) and a section of the flexible edge (20) associated with the key (23) being adjusted.

2. The fluid metering apparatus of claim 1 including rotary position indicating means (45) and further characterized in that said rotary position indicating means senses the rotary position of a selected key (23) and generates an electrical signal indicative of the sensed rotary position.

3. The fluid metering apparatus of claim 2 further characterized in that said rotary position indicating means (45) includes a magnetic field sensor (47) carried by said carriage (12) and field generating means (46) for generating a magnetic field at said magnetic field sensor having a characteristic indicative of the rotary position of a selected key (23).

4. The fluid metering apparatus of claim 1 further characterized in that said carriage (12) is mounted on spaced apart track members (28) substantially parallel with said flexible edge (20) and wherein said first drive means (32, 34, 35, 36) includes an endless tape (32) secured to said carriage (12) and entrained about a sprocket (34, 37) and an idler wheel (35) and a stepping motor (36) to drive said sprocket (34, 37).

5. The fluid metering apparatus of claim 1 further characterized in that said second drive means includes a stepping motor (39) carried by said carriage (12).

6. The fluid metering apparatus of claim 1 further characterized in that each of said rotatable keys (23) comprises a barrel (24) threaded through a support member (18) with a tip (25) projecting forwardly to bear against said flexible edge (20) and a rearward extension having its friction wheel (26) secured thereto.

7. The fluid metering apparatus of claim 1 further characterized in that said second drive means comprises a reversible stepping motor (39) and an idler wheel (44) driven thereby, said idler wheel (44) being positioned to engage in succession the friction wheel (26) of each said key (23) as said carriage (12) moves along the line of keys (23).

8. The fluid metering apparatus of claim 1 wherein said carriage (12) is mounted for reciprocating movement on track members (28) characterized in that said first drive means comprises a drive shaft extending across said fountain, a travelling helical gear (57) mounted on said drive shaft (52) for rotation therewith while being freely movable along said drive shaft, a mating gear (59) affixed to a stub shaft (60) on said carriage and intermeshed with said travelling helical gear (57), a pinion gear (62) affixed to said stub shaft (60), and a rack (63) extending along and affixed to the base of said fountain and intermeshing with said pinion gear (62) whereby rotation of said drive shaft (52) causes said carriage (12) to move along said track members (28).

Patentansprüche

1. Flüssigkeits-Dosiergerät (10), welches aufweist:

eine Tauchwalze (17);

Mittel (19) zum Dosieren der Flüssigkeit auf der Tauchwalze, wenn diese rotiert, wobei diese Flüssigkeits-Dosiermittel eine flexible Kante (20), welche der Tauchwalze (17) benachbart angeordnet ist, aufweisen;

eine Mehrzahl von einzeln drehbaren Einstellelementen (23), welche die flexible Kante an über ihre Länge verteilten Stellen einstellbar berühren, wobei die Drehstellung jedes Einstellelementes den Abstand zwischen einem ihr zugeordneten Abschnitt der flexiblen Kante (20) und der Tauchwalze (17) bestimmt;

erste Antriebsmittel (32, 34, 35, 36);

zweite Antriebsmittel (39);

einen Wagen (12);

ein verfahrbares Reibrad (40, 41, 42, 43, 44);

wobei.

jedes Einstellelement (23) ein an ihm befestigtes Reibrad (26) aufweist;

der Wagen (12) so montiert ist, dass er sich längs der Einstellelemente (23) bewegen kann;

die ersten Antriebsmittel (32, 34, 35, 36) die Bewegung des Wagens (12) steuern; und

das verfahrbare Reibrad (40, 41, 42, 43, 44) durch den Wagen (12) geführt und so positioniert wird, dass es mit dem Reibrad (26) jedes Einstellelementes (23) einzeln zusammenarbeitet, wenn der Wagen (12) sich an diesem vorbeibewegt;

dadurch gekennzeichnet, dass die zweiten Antriebsmittel (39) das verfahrbare Reibrad (40, 41, 42, 43, 44) drehen

(I) mit einer Geschwindigkeit und in einer Richtung, welche synchronisiert sind mit der Bewegung des Wagens (12), derart, dass es, wenn dieser an einem nicht zu verstellenden Einstellelement (23) vorbeikommt, dieses überrollt; und

(II) mit einer Geschwindigkeit und in einer Richtung, derart, dass wenn es an einem zu verstellenden Einstellelement vorbeikommt, die Einstellung des gewünschten Abstandes zwischen der Tauchwalze (17) und dem einzustellenden Einstellelement (23) zugeordneten Abschnitt der flexiblen Kante (20) bewirkt.

2. Flüssigkeits-Dosiergerät nach Anspruch 1, welches Drehstellungs-Anzeigemittel (45) aufweist, dadurch gekennzeichnet, dass die Drehstellungs-Anzeigemittel die Drehstellung eines bestimmten Einstellelementes (23) abtasten und ein elektrisches Signal erzeugen, welches die abgetastete Drehstellung anzeigt.

3. Flüssigkeits-Dosiergerät nach Anspruch 2, dadurch gekennzeichnet, dass die Drehstellungs-Anzeigemittel (45) aufweisen:

einen Magnetfeldsensor (47), welcher vom Wagen (12) mitgeführt wird; und

einen Feldgenerator (46) zur Erzeugung eines Magnetfeldes im Bereich des Magnetfeldsensors, welches ein Kennzeichen für die Drehstellung des ausgewählten Einstellelementes (23) ist.

4. Flüssigkeits-Dosiergerät nach Anspruch 1, dadurch gekennzeichnet, dass der Wagen (12) auf im Abstand voneinander angeordneten Schienen (28) montiert ist, welche im wesentlichen parallel zur flexiblen Kante (20) verlaufen, und dass die ersten Antriebsmittel (32, 34, 35, 36) ein am Wagen (12) befestigtes und über ein Kettenrad (34, 37) angetriebenes endloses Band (32) sowie einen Schrittmotor (39) zum Antreiben des Kettenrades (34, 37) aufweisen.

5. Flüssigkeits-Dosiergerät nach Anspruch 1, dadurch gekennzeichnet, dass die zweiten Antriebsmittel einen vom Wagen (12) mitgeführten Schrittmotor (39) aufweisen.

6. Flüssigkeits-Dosiergerät nach Anspruch 1, dadurch gekennzeichnet, dass jedes der drehbaren Einstellelemente (23) eine durch einen Träger (18) durchgeschraubte Stellschraube (24) aufweist, welche eine an die flexible Kante (20) anliegende vorspringende Spitze (25) und eine nach rückwärts gerichtete Verlängerung aufweist, auf welcher ihr Reibrad (26) befestigt ist.

7. Flüssigkeits-Dosiergerät nach Anspruch 1, dadurch gekennzeichnet, dass die zweiten Antriebsmittel einen Umkehr-Schrittmotor (39) und ein durch diesen angetriebenes Zwischenrad (44) aufweisen, wobei das Zwischenrad (44) so positioniert ist, dass es nacheinander mit dem Reibrad (26) jedes der Einstellelemente (23) zusammenarbeitet, wenn der Wagen (12) sich der Reihe der Einstellelemente entlang bewegt.

8. Flüssigkeits-Dosiergerät nach Anspruch 1, bei welchem der Wagen (12) für eine Hin- und Herbewegung auf Schienen (28) montiert ist, dadurch gekennzeichnet dass die ersten Antriebsmittel aufweisen:

eine sich über die Länge der Tauchwalze (17) erstreckende Antriebswelle (52);

ein auf der Antriebswelle (52) montiertes mitlaufendes Schraubgewinde (57), welches sich mit dieser dreht, in Längsrichtung derselben jedoch frei beweglich ist;

ein Gegenrad (59), welches auf einer Flanschwelle (60) auf dem Wagen befestigt ist und mit dem mitlaufenden Schraubgewinde (57) zusammenarbeitet;

ein Ritzel (62), welches auf der Flanschwelle (60) befestigt ist; und

eine Zahnstange (63), welche sich längs der Basis der Tauchwalze (17) erstreckt und an dieser Basis befestigt ist, und welche mit dem Ritzel (62) zusammenarbeitet, wobei die Drehung des Antriebswelle (52) bewirkt, dass sich der Wagen (12) den Schienen (28) entlang bewegt.

Revendications

1. Appareil de dosage de fluide (10) comprenant:

un rouleau à réservoir (17), des moyens (19) pour doser le fluide sur ledit rouleau à réservoir lorsque ce rouleau tourne, lesdits moyens de dosage comportant un bord flexible (20) juxtaposé audit rouleau à réservoir (17), une pluralité de touches individuellement tournantes (23) qui sont en contact de façon réglable avec ledit bord flexible à des endroits espacés le long de celui-ci, la position de rotation de chaque touche déterminant l'espacement entre une partie associée dudit bord flexible (20) et ledit rouleau à réservoir (17), des premiers moyens d'entraînement (32, 34, 35, 36), des deuxièmes moyens d'entraînement (39), un chariot (12), une roue pouvant être entraînée par friction (40, 41, 42, 43, 44),

chaque touche (23) comportant une roue à friction (26) fixée à ladite touche;

le chariot étant monté pour un mouvement le long de ladite pluralité de touches (23);

les premiers moyens d'entraînement (32, 34, 35, 36) commandant le mouvement dudit chariot (12); et

la roue à entraînement par friction (40, 41, 42, 43, 44) étant portée par ledit chariot (12) et placée de manière à venir individuellement en contact avec la roue à friction (26) de chaque touche (23) lorsque ledit chariot (12) passe devant cette dernière;

caractérisé en ce que

les deuxièmes moyens d'entraînement (39) font tourner ladite roue à entraînement par friction (40, 41, 42, 43, 44) à (i) une vitesse et une direction synchronisées avec le mouvement du chariot (12), en face d'une touche (23) qui ne doit pas être réglée, de manière à rouler sur cette touche et (ii) une vitesse et une direction, à l'endroit d'une touche à régler, telles qu'on obtient un espacement désiré entre le rouleau à réservoir (17) et une partie du bord flexible (20) associée à la touche (23) qui est ainsi réglée.

2. Appareil de dosage de fluide suivant la revendication 1, comprenant des moyens d'indication de position de rotation (45) et caractérisé en outre en ce que lesdits moyens d'indication de position de rotation détectent la position de rotation d'une touche choisie (23) et fournissent un signal électrique indicatif de la position de rotation détectée.

3. Appareil de dosage de fluide suivant la revendication 2, caractérisé en outre en ce que les dits moyens d'indication de position de rotation (45) comprennent un capteur de champ magnétique (47) porté par ledit chariot (12) et des moyens de génération de champ (46) pour engendrer un champ magnétique, à l'endroit du dit capteur de champ magnétique, ayant une caractéristique indicative de la position de rotation d'une touche choisie (23).

4. Appareil de dosage de fluide suivant la revendication 1, caractérisé en outre en ce que le dit chariot (12) est monté sur des guidages mutuellement espacés (28) sensiblement parallèles audit bord flexible (20), et dans lequel lesdits premiers moyens d'entraînement (32, 34, 35, 36) comprennent une courroie sans fin (32) fixée audit chariot (12) et entraînée autour d'un pignon (34, 37) et d'une poulie folle (35), et un moteur pas-à-pas (36) pour entraîner ledit pignon (34, 37).

5. Appareil de dosage de fluide suivant la revendication 1, caractérisé en outre en ce que les dits deuxièmes moyens d'entraînement comprennent un moteur pas-à-pas (39) porté par ledit chariot (12).

6. Appareil de dosage de fluide suivant la revendication 1, caractérisé en outre en ce que chacune desdites touches rotatives (23) comprend une tige (24) vissée à travers un support (18) et comportant un bout (25), en saillie vers l'avant de manière à appuyer contre ledit bord flexible (20), et un prolongement arrière auquel est fixée sa roue à friction (26).

7. Appareil de dosage de fluide suivant la revendication 1, caractérisé en outre en ce que lesdits deuxièmes moyens d'entraînement comprennent un moteur réversible pas-à-pas (39) et une roue intermédiaire (44) entraînée par celui-ci, ladite roue intermédiaire (44) étant placée de manière à venir en contact successivement avec la roue à friction (26) de chaque dite touche (23) lorsque ledit chariot (12) se déplace le long de la ligne de touches (23).

8. Appareil de dosage de fluide suivant la revendication 1, dans lequel ledit chariot (12) est monté pour un mouvement de va-et-vient sur les guidages (28), caractérisé en ce que lesdits premiers moyens d'entraî nement comprennent un arbre d'entraînement s'étendant d'un côté à l'autre dudit réservoir, un engrenage hélicoïdal suiveur (57) monté sur ledit arbre d'entraînement (52) pour rotation avec celui-ci tout en pouvant se déplacer librement le long dudit arbre d'entraînement, un pignon associé (59) fixé à un arbre (60) sur ledit chariot et en engrènement avec ledit engrenage hélicoïdal suiveur (57), un pignon (62) fixé audit arbre (60) et une crémaillère (63) s'étendant le long de la base dudit réservoir et fixée à celle-ci et en engrènement avec ledit pignon (62) de sorte que la rotation dudit arbre d'entraînement (52) provoque le déplacement dudit chariot le long desdits guidages (28).

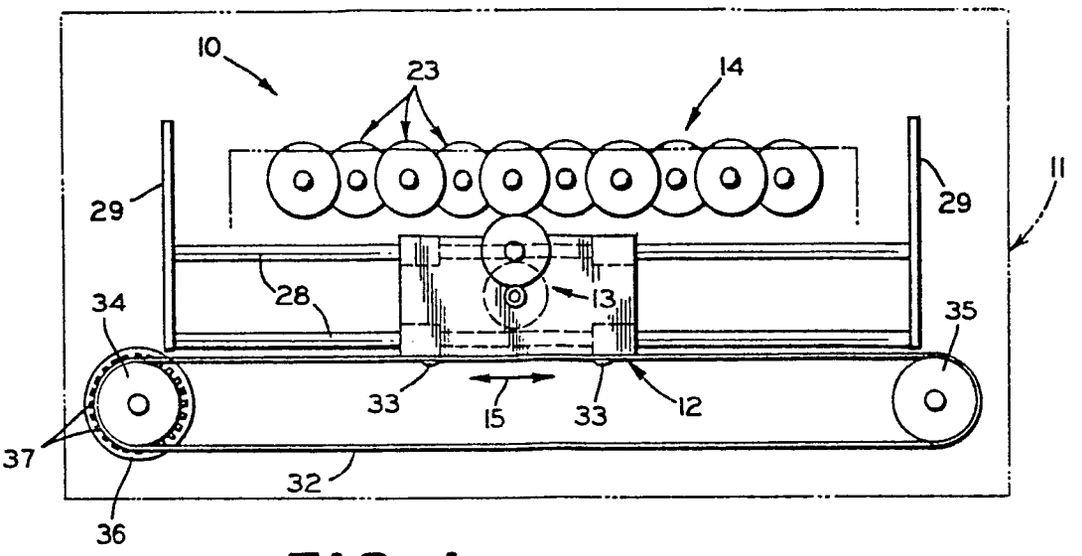

FIG. 1

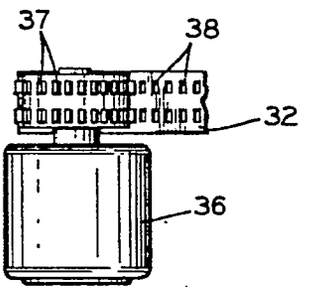

FIG. 2

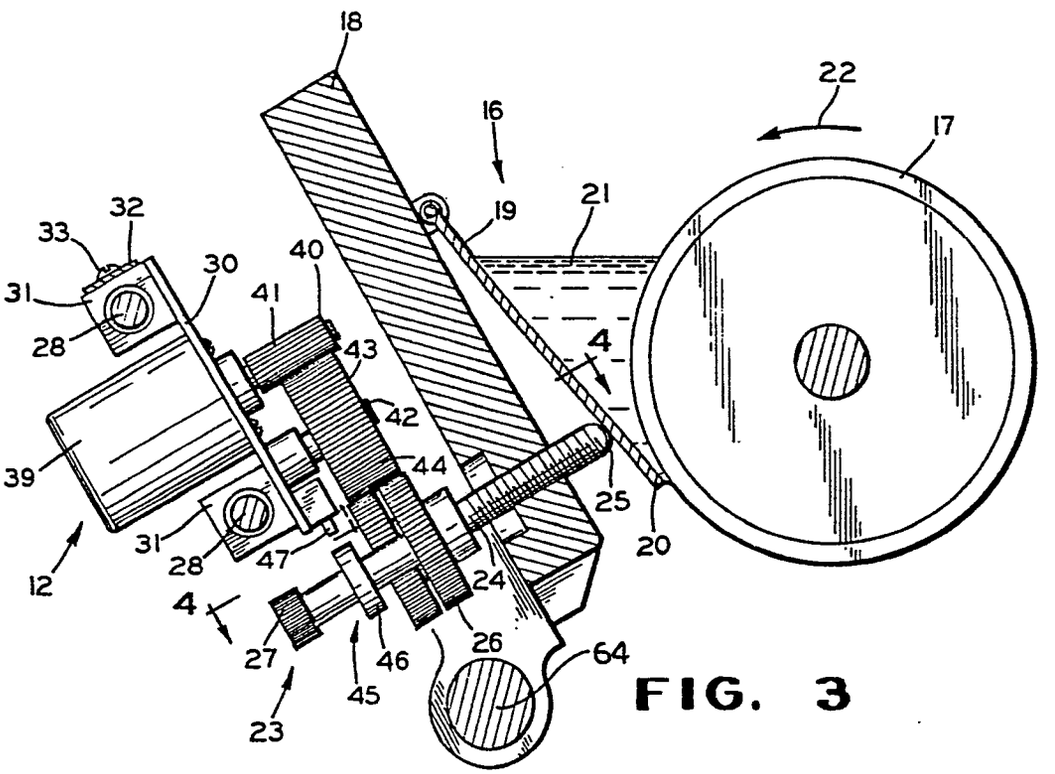

FIG. 3

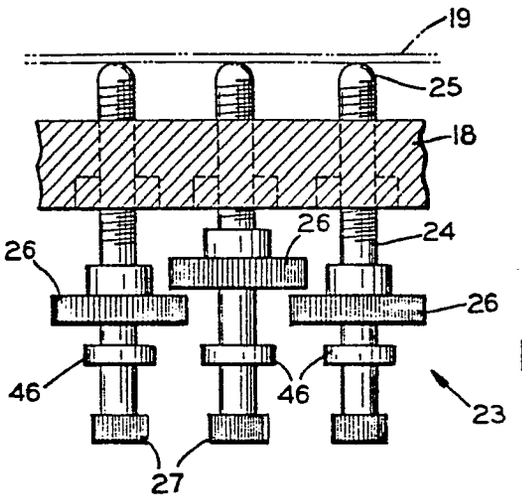
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FIG. 4

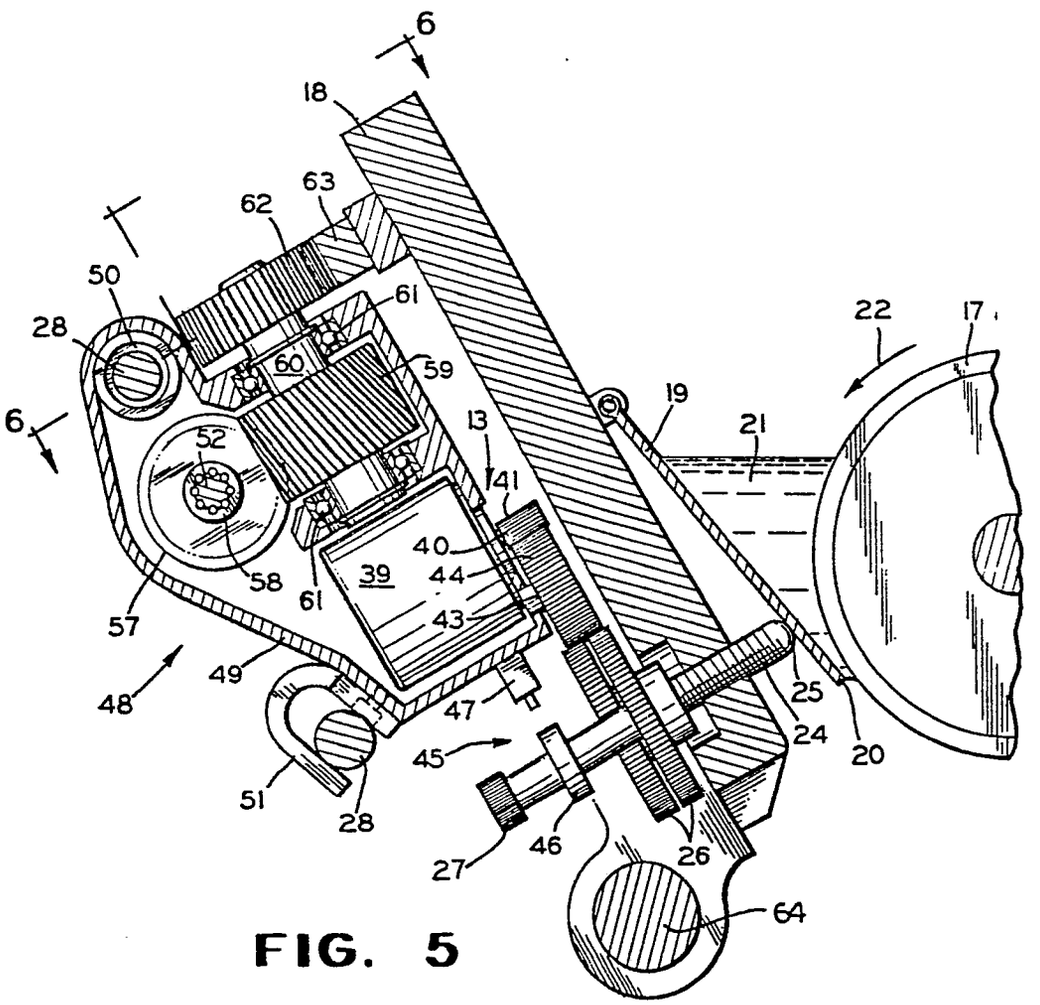
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FIG. 5

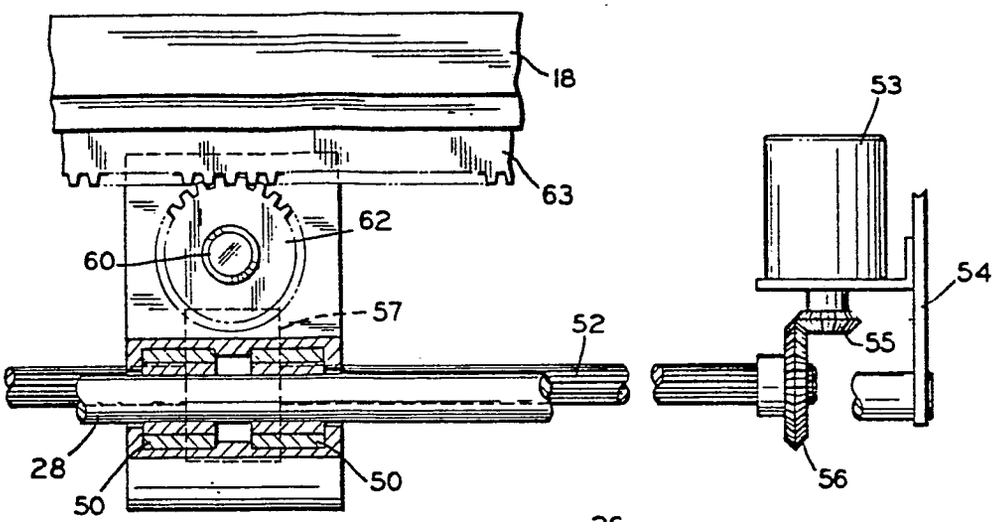

FIG. 6

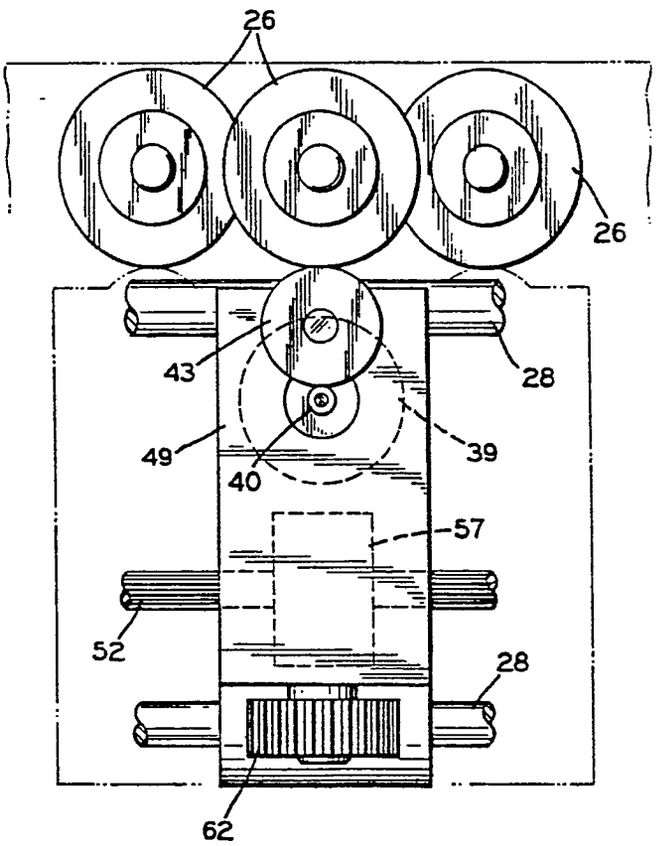

FIG. 7