Aug. 14, 1934. R. B. DOTY 1,969,877

FORM ALIGNING DEVICE

Filed Nov. 2, 1932 2 Sheets-Sheet 1

Fig. 1.

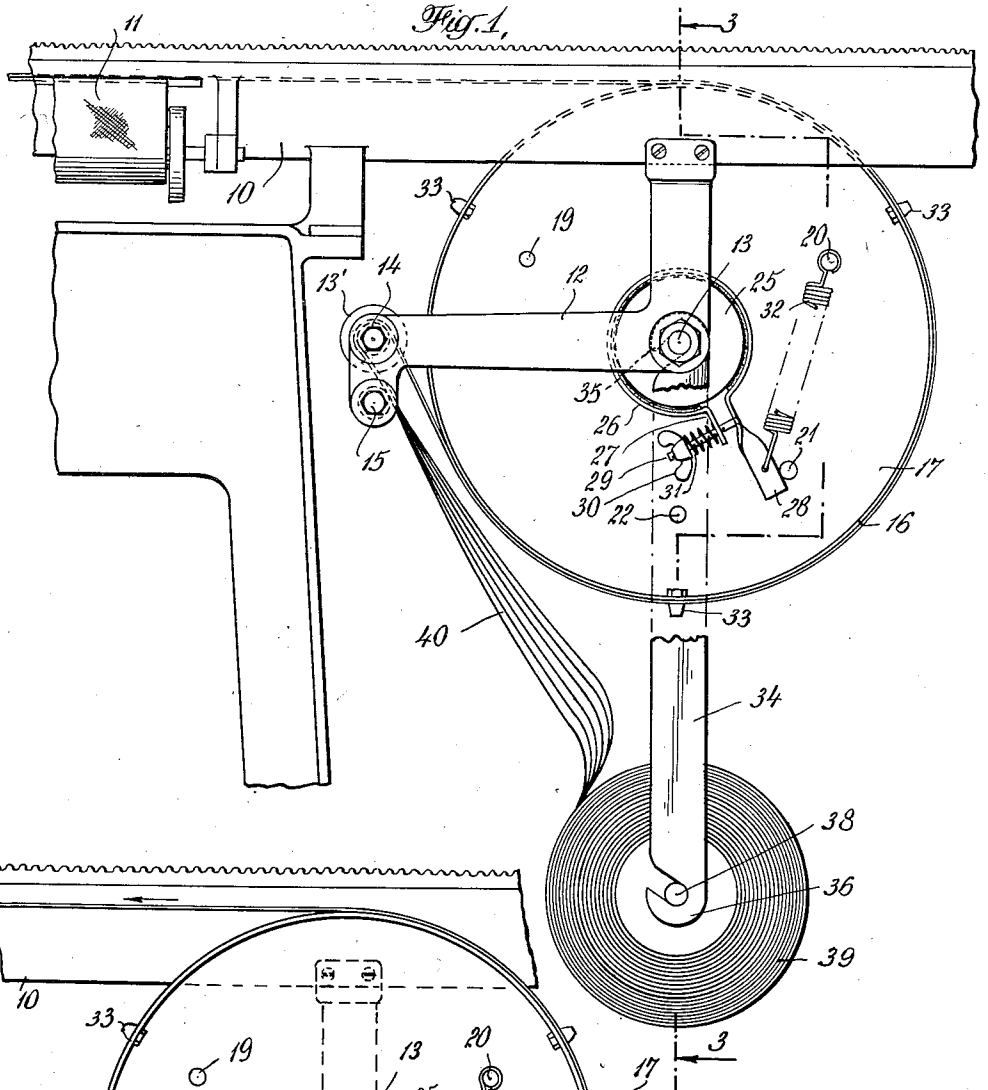
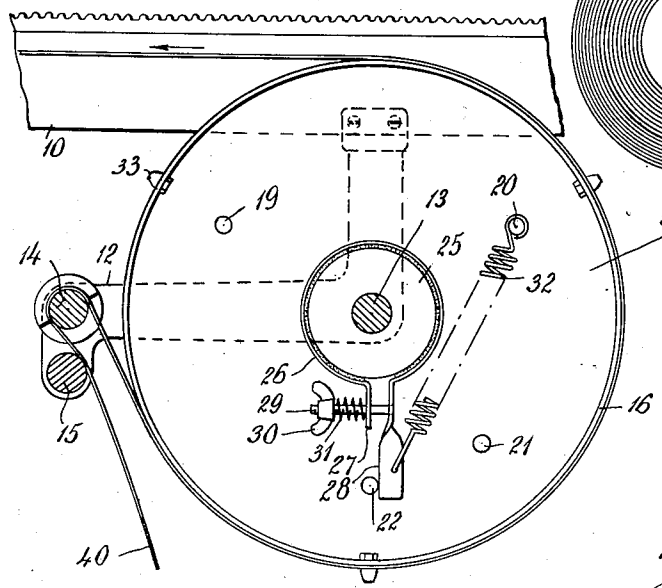


Fig. 2.



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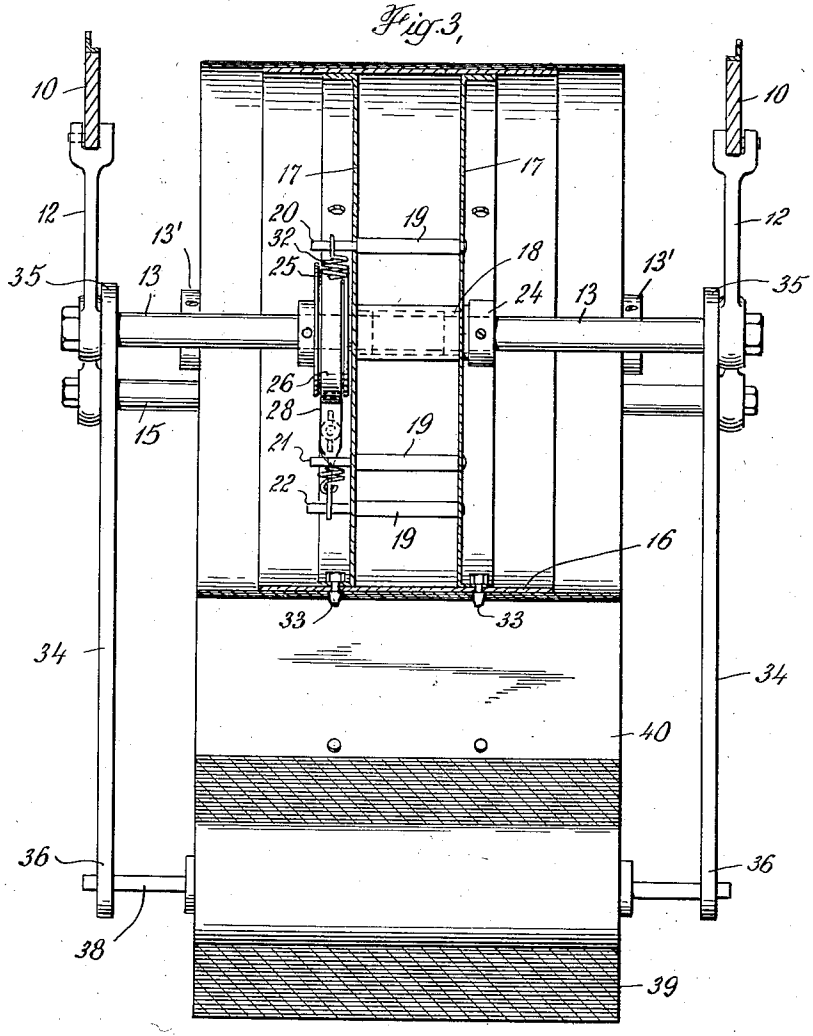
ATTORNEYS

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Filed Nov. 2, 1932 2 Sheets-Sheet 2

Fig. 3.



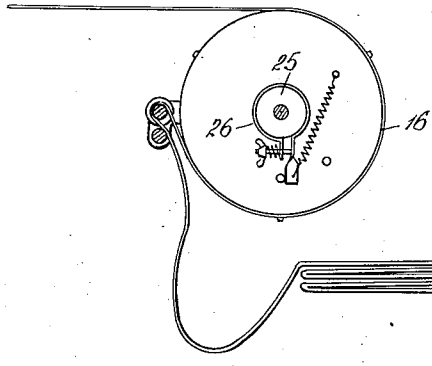


Fig. 4.

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UNITED STATES PATENT OFFICE

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FORM ALIGNING DEVICE

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Application November 2, 1932, Serial No. 640,857

7 Claims. (Cl. 271—2.1)

This invention relates to an aligning device and has particular reference to a device for maintaining in alignment and under proper tension the multiplicate stationery forms used in business machines and the like.

Multiplicate forms are ordinarily provided in the form of continuous superimposed strips of paper, with or without carbon interleaves, and the strips are perforated at spaced points so that the multiplicate forms may be separated from the continuous strips after they have been inscribed with data material by the typewriting, bookkeeping, tabulating, or other business machine for which they are adapted. These multiplicate form strips are initially provided either in zig-zag folded condition or in rolled form and usually have holes by which the separate forms may be filed after they have been inscribed with the data material. When these form strips are fed to the business machine, they frequently creep relatively to each other and are not in alignment by the time that they reach the typing mechanism of the business machine, so that the tabulations on the successive sheets of each form do not appear in the spaces provided therefor. It is accordingly desirable to maintain the form strips in exact alignment as they are fed to the machine. It is also desirable to maintain the form strips under tension so that they are supplied uniformly to the platen of the machine.

According to the present invention a device is provided whereby the form strips are maintained in exact alignment and under tension as they are fed to the platen of the business machine, so that the tabulations or inscriptions applied to the stationery by the machine cannot be displaced on the several forms and any slack occasioned by accidental overfeeding or overrunning of the form strips is taken up before they are drawn into the machine.

The new device utilizes the filing holes of the form strips for maintaining them in alignment and under proper tension and includes a rotatable drum having spaced pins so arranged that as the continuous form strips are drawn over the drum the pins pass through the filling holes and thus maintain the forms in exact alignment. The rotation of the drum is retarded by a brake mechanism including a stationary brake drum concentric with the feeding drum and carrying a brake band connected to the feeding drum. This connection provides for a limited amount of lost motion which permits a spring to reverse the direction of rotation of the feeding drum to take up slack in the form strips, this spring having been placed under tension by rotation of the feed drum in the feeding direction. The brake mechanism is adjustable and tends to prevent overrunning of the feeding form strips, while the spring means maintains the form strips under a predetermined tension at all times as they are drawn over the platen of the machine.

The new device is arranged to be mounted on or adjacent to the business machine so that the forms are fed to the platen thereof in operative relation to the typewriting or other tabulating mechanism of the machine. The device is particularly adapted for use with a flat platen type of machine such as the Elliot-Fisher bookkeeping machine but its use is not limited to that type of machine and it may be adapted to other machines employing multiplicate forms or strip stationary or material.

For a more complete understanding of the invention reference is made to the accompanying drawings, in which

Fig. 1 is an elevation of the new form aligning and tensioning device of this invention applied to a flat platen type of business machine;

Fig. 2 illustrates the device in operation;

Fig. 3 is a vertical section through the device as seen along the line 3—3 of Fig. 1, and

Fig. 4 illustrates the use of the device with zig-zag folded stationery.

In these drawings, numeral 10 designates the tracks along which the typing carriage of the machine moves over the flat platen 11. This is the arrangement of the Elliot-Fisher business machine and will serve to illustrate the invention, but the invention is adaptable to other machines with equal facility.

L-shaped brackets 12 are secured to each of the tracks 10 and carry the stationary shaft 13 and the two guide bars 14 and 15. Journalled on the shaft 13 is a feeding drum 16 having the spiders 17 fitted with the bushings 18 and spaced by pins 19, three of which have projections 20, 21 and 22 extending axially beyond the surface of one of the spiders 17. The drum is properly centered on the shaft 13 by the collar 24 and the brake drum 25, both of which are secured to the shaft 13 by means of set screws or the like.

Frictionally engaging the brake drum 25 is a brake band 26 having the extension 27 and the arm 28 connected by a bolt 29 carrying the wing nut 30 over the spring 31. By adjusting the wing nut 30, the friction between the drum 25 and band 26 may be varied at will. The arm 28 lies between the pins 21 and 22, which accordingly limit the angular movement of the feeding drum 16 independently of the brake band 26 and provide a limited lost motion for the feeding drum 16.

A tension spring 32 is connected at one end to the arm 28 and at the other end to the pin 20. This spring normally urges the feeding drum in a clockwise direction such that the arm 28 and pin 21 are in engagement and this is the condition of the mechanism when the device is not in opera-

tion or when no force is applied to the drum tending to rotate it in a counter-clockwise direction. This condition of the mechanism is illustrated in Fig. 1.

Secured on the outer surface of feedng drum 16 are several sets of pins 33. These pin sets are spaced apart circumferentially of the drum 16 a distance equal to the spacing between the set of filing perforations or holes provided in the form strips to which the drum is adapted. The feeding drum 16 is accordingly made of such diameter that the set of pins 33 fit into the filing holes in the form strips as they pass over the drum. These pins 33 may be conveniently employed for securing the spiders 17 to the drum 16 in the manner illustrated in Fig. 3. Spacers 13', provided on guide bar 14, are adjustable to engage the edges of the form strips to guide them over the drum 16 so that the filing holes align with pins 33.

If multi-roll stationery is to be used in the business machine, the roll of stationery is conveniently suspended from the stationary shaft 13 by means of hangers 34 having hooks 35 at their upper ends for engaging the shaft 13 and hooks 36 at their lower ends in which the rod 38 carrying the roll of stationery 39 is removably mounted.

If flat zig-zag folded stationery is to be used in the business machine, the hangers 34 are not necessary and the stationery pack 41 is placed beneath the feeding drum, as illustrated in Fig. 4.

In operation, the new device of this invention is placed adjacent to the business machine or is mounted thereon in the manner described and the form strips 40 are threaded between the guide bars 14 and 15 and passed under and around the feeding drum to the platen 11 of the machine, the pins 33 being inserted in the filing holes of the strips in a manner readily understood.

At the beginning of the feeding operation, the spring 32 is not under tension and the mechanism is in the condition illustrated in Fig. 1. As the form strips 40 are drawn through the machine, the feeding drum is initially rotated independently of the brake band 26, so that pin 21 moves away from arm 28 and pin 22 approaches arm 28, until arm 28 and pin 22 eventually engage each other and spring 32 is placed under tension. Further rotation of the feeding drum 16 causes brake band 26 to be rotated around brake drum 25, the frictional resistance of which retards the rotation of the feeding drum 16 and places the form strips 40 under uniform tension as they leave the feeding drum 16. The degree of this tension may be varied by adjusting wing nut 29 to increase or decrease the tightness of the brake band 26 on the brake drum 25.

The pins 33 pass through the filing holes in all of the superimposed form strips 40 and in this way maintain them in alignment even though there is a tendency of the strips to creep relatively to each other because of the natural buckling of the inner strips as they leave the roll 39, as is illustrated in Fig. 1. The form strips 40 are accordingly supplied to the platen 11 of the business machine in exact alignment.

As long as the pull on the form strips 40 is substantially steady, the arm 28 and the pin 22 remain in driving engagement, but if the strips 40 are overdrawn so that they tend to become slack or loose, the spring 32 rotates the feeding drum 16 in a reverse direction until the slack or looseness is taken up. Further pull on the strips 40 causes feeding drum 16 to rotate independently of the brake arm 28 until the arm 28 and the pin 22 again engage.

In this way the form strips 40 are maintained under proper tension at all times and any looseness thereof is immediately compensated for. When no tension is applied to the form strips, the spring 32 returns the feeding drum 16 to its initial position with the arm 28 and pin 21 in engagement, as shown in Fig. 1.

The feeding, aligning and tensioning of the flat pack stationery 41 is performed in precisely the same way.

I claim:

1. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, means resisting rotation of the drum, and a direct resilient connection between the means and the drum urging the drum in a reverse direction to tension the forms feeding therefrom.

2. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, means resisting rotation of the drum, a driving connection between the drum and the means effective when the drum rotates in feeding direction, and a spring connecting the drum and the means for opposing the said driving connection.

3. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, brake means, driving connections between the drum and the means effective when the drum rotates in feeding direction, and a spring connecting the means and the drum for normally urging the drum in a reverse direction.

4. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, brake means having an arm, and an abutment on the drum engageable by the arm upon rotation of the drum in feeding direction for resisting rotation of the drum.

5. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, rotatable brake means concentric with the drum, and an abutment on the drum engageable with the means to rotate the latter upon rotation of the drum in a feeding direction for resisting the rotation of the drum.

6. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, rotatable brake means, driving connections between the drum and the means whereby the former rotates the latter when the drum is driven in feeding direction, and a spring between the brake means and the drum for urging the drum in a reverse direction and upon interruption of the sheet material feed.

7. In a device for feeding continuous sheet material, the combination of a drum rotatable by the sheet material fed thereover, rotatable brake means having an arm, spaced abutments on the drum between which the arm extends for limiting the relative movement between the drum and means, and a spring inter-connecting the drum and arm for urging the drum in a direction opposite to the feeding direction.

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