Jan. 8, 1935. F. R. McMURRY 1,987,484

PAPER FEED MECHANISM

Filed Sept. 19, 1930

FIG. 1

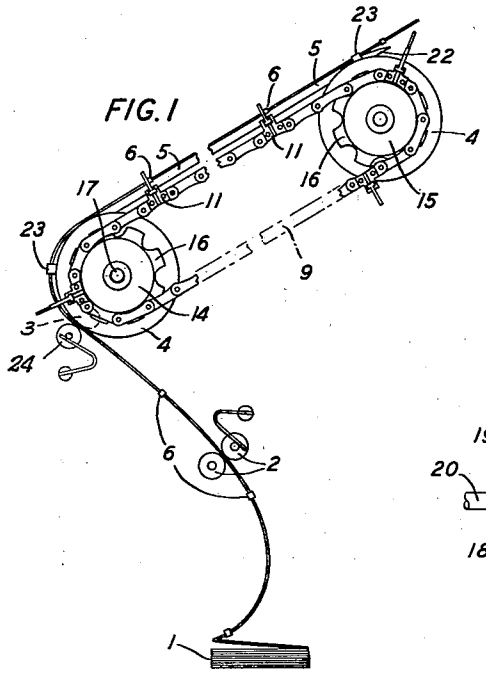



FIG. 5




FIG. 6




FIG. 2

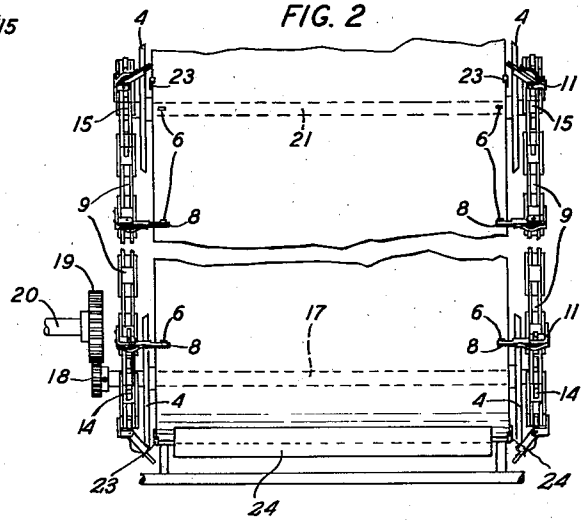



FIG. 3

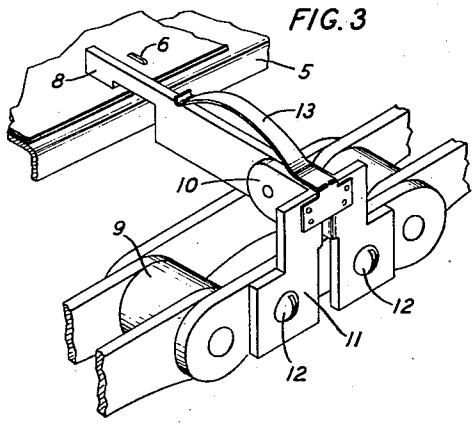
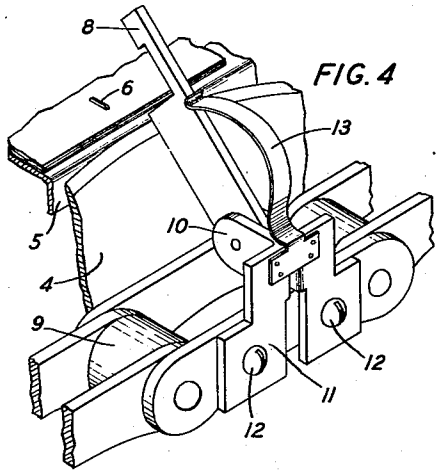



FIG. 4




INVENTOR
F. R. McMURRY
BY J. W. Schmied
ATTORNEY

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## PAPER FEED MECHANISM

Fred R. McMurry, Westwood, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

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12 Claims. (Cl. 271—2.1)

This invention relates to a method of and mechanism for feeding multicopy stationery through a typewriting machine, particularly a printing telegraph machine.

An object of this invention is to provide an arrangement for feeding multicopy stationery through a printing machine.

A feature of this invention is a specially stapled superfolded paper for cooperating with the paper feed mechanism.

It is well known in the art that a series of strips of paper for producing multiple copies as an original is printed may be fed over the platen of a printing machine by perforating the paper and providing sprocket wheels which cooperate with the perforations in the paper to feed the paper through the machine.

This invention comprises a method of feeding the paper by means of an endless sprocket chain having projecting fingers which engage staples which are affixed to the paper. In accordance with the preferred form of this invention, two sprocket chains, one on either side of the paper, are provided for cooperating with the staples which are slightly raised above the paper for engaging with the fingers of the chain.

Another feature of this invention resides in a sleeve arrangement for disengaging the fingers of the endless sprocket chain from the paper.

Another feature of this invention is a finger assembly which possesses a pivoting mechanism which permits fingers to press lightly on the paper as the fingers are moved forward to engage with staples in the stationery.

A further feature is an adjustable endless sprocket chain which may have a plate attached to each link for connection with a finger assembly. By means of this feature, the distances between fingers may be regulated to engage the staples of paper forms of different sizes.

The drawing illustrates the essential features of an embodiment of the invention adapted for use with an otherwise conventional type of printing telegraph machine.

Fig. 1 illustrates a side elevation of the paper feed apparatus;

Fig. 2 illustrates a top plan view of the feeding devices cooperating with the stapled paper;

Fig. 3 shows a detailed side view of a finger and the finger assembly as affixed to the sprocket chain;

Fig. 4 shows the same detailed view as Fig. 3 but with the finger raised above the paper by the action of the sleeve mechanism;

Fig. 5 is a cross-sectional view of the multicopy stationery having one type of staple affixed thereto; and

Fig. 6 is a cross-sectional view of the multicopy stationery having another type of staple affixed thereto.

Referring to the drawing, a supply of specially stapled superfolded paper 1 is arranged to pass through tension rollers 2 prior to being fed over platen 3 of the printing machine. Platen 3 is shown in Fig. 1 by broken lines since it is hidden behind sleeve 4. Although platen 3 is illustrated in the drawing as a fixed element attached to paper table 5 it is to be understood that it may be a rotatable cylinder if desired.

The superfolded paper 1 comprises a series of strips of paper 7 with a "one time carbon" sheet interposed between each paper strip for producing duplicate copies of the printed matter. The strips 7 are fastened together by staples 6 which are arranged horizontally on each side of the paper close to the edge. It is to be understood of course that this invention is not limited to stationery composed of a plurality of strips 7 but that a single sheet fastened in the manner above mentioned may also be used. Staples 6 are preferably metallic and may be made of either flat or round wire. They rise a few thousandths of an inch above the top surface of the first or original sheet in order to engage with projecting fingers 8 which are attached to endless sprocket chains 9. These fingers 8, 8 are pivoted at 10 to a finger assembly 11 affixed to chain 9 by screws 12. This manner of attachment permits affixing a finger 8 to each link of the chain 9. In this way the distances between fingers 8 may be easily regulated and adjusted to engage the staples 6 of forms of paper which differ in size. Spring 13 exerts a slight pressure upon finger 8 to cause the latter to press lightly on the paper as it moves forward to engage the upraised staple 6.

Sprocket chains 9, 9 are constructed of links pivoted together and have a series of openings regularly spaced for engaging with the teeth 16 of rotary sprocket wheels 14, 14 and 15, 15. Sprocket wheels 14, 14 are attached to shaft 17 which is provided at one end with gear 18 which meshes with gear 19 on the line feed shaft 20. Sprocket wheels 15, 15 are idler wheels attached to shaft 21 and are caused to rotate by the movement of the sprocket chains 9, 9 which are driven by sprocket wheels 14, 14, in turn being driven by the line feed shaft 20 through gears 19 and 18.

Attached to shafts 17 and 21 and located between the chains 9 and paper table 5 are sleeves 4 for raising the projecting fingers 8 from the

paper as the fingers 8 near the turning point of the chain 9. This arrangement allows free movement of the paper as it is fed from supply 1 past the end of the paper table 5. A cutting knife edge 22 is provided for paper table 5 for severing the paper from the web. It may be desirable to provide perforations along the width of the paper at predetermined intervals to assist in the severing of the paper.

For aligning the paper accurately metallic guides 23, 23 are provided which are attached to the paper table and curve around it towards the front. These guides are so located with respect to the platen and table that the paper is loosely guided. The fingers of the chain are raised by the sleeves at these points and therefore cannot engage the guides.

It may be desirable to have a horizontal bar or a pressure roller 24 loosely bearing on the paper near the printing point of the platen to help reduce any tendency of the paper to buckle and to obviate any undesirable bulging of the paper.

In operation, the stationery is so started, by the operator that the staples 6 are slightly ahead of the fingers 8. The printing machine is then operated which results in the sprocket wheels 14 driving the chains 9 and the fingers 8 of the chains 9 engaging the staples 6 on the paper to carry the paper forward a definite distance in accordance with the space of a particular form or in accordance with the desire of the operator. The aligning guides 23 and pressure roller 24 tend to prevent buckling of the paper sheets 7. The strips are thus always in alignment at the staple points, the adjustment at the printing point being accomplished by the operator.

It is to be understood that various modifications of the different parts of this arrangement can be made without departing from the scope of this invention. For instance, continuous guiding may easily be provided for the paper by affixing to the paper table 5 a slightly raised portion along both edges of the table 5 which does not make contact with the fingers 8 or by extending the vertical portion of the fingers 8 to touch the sides of the paper table. A construction such as described herein may be used for all kinds of writing, typewriting, and printing telegraph machines.

What is claimed is:

1. In a typewriting machine for typing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, and a plurality of springs for causing the fingers to press the stationery against the paper table.

2. In a printing telegraph machine for printing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, and aligning means for aligning the stationery as it starts to pass over the paper table.

3. In a machine for typing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, and instrumentalities for causing the fingers to disengage the staples.

4. In a typewriting machine for typing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, and an instrumentality for preventing undesirable bulging and buckling of the stationery.

5. In a machine for typing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, a plurality of springs for causing the fingers to press the stationery against the paper table, instrumentalities for causing the fingers to disengage the staples, and aligning means for aligning the stationery as it starts to pass over the paper table.

6. In a typewriting machine for typing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, a plurality of springs for causing the fingers to press the stationery against the paper table, aligning means for aligning the stationery as it starts to pass over the paper table, and an instrumentality for preventing undesirable bulging and buckling of the stationery.

7. In a machine for typing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, a plurality of springs for causing the fingers to press the stationery against the paper table, instrumentalities for causing the fingers to disengage the staples, aligning means for aligning the stationery as it starts to pass over the paper table, and a pressure roller for preventing un-

desirable bulging and buckling of the stationery.

8. Multicopy stationery comprising a plurality of sheets of paper having a carbon sheet interposed between each sheet of paper and instrumentalities for engaging with the feeding mechanism of a typewriting machine, said instrumentalities including staples affixed to the sheets of paper at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of paper.

9. Multicopy stationery comprising a plurality of sheets of paper having a carbon sheet interposed between each sheet of paper, and instrumentalities for engaging with the feeding mechanism of a typewriting machine, said instrumentalities including staples affixed to the sheets of paper at spaced intervals along each margin, said staples rising a few thousandths of an inch above the surface of the top sheet of paper.

10. In a machine for printing upon a plurality of strips of paper interleaved with carbon sheets and bound together with staples, feeding mechanism for feeding the strips of paper through the machine, said mechanism including a paper table for supporting the strips of paper, an endless chain driven by toothed rotary means engaging spaced openings in the chain, and a plurality of fingers pivotally attached to the chain and projecting therefrom, said fingers being adapted to press the strips of paper against the paper table and to engage the staples to carry the paper forward while the chain is being driven by the toothed rotary means.

11. In a printing telegraph machine for printing upon a plurality of strips of paper interleaved with carbon sheets and bound together with staples, feeding mechanism for feeding the strips of paper through the machine, said mechanism including a paper table for supporting the strips of paper, an endless belt driven by toothed rotary means engaging spaced openings in the belt, a plurality of fingers pivotally attached to the belt and projecting therefrom, said fingers being adapted to press the strips of paper against the paper table and to engage the staples to carry the paper forward while the belt is being driven by the toothed rotary means, and instrumentalities for raising the fingers to disengage the staples when the fingers reach a turning point in the endless belt.

12. In a printing telegraph machine for printing upon unperforated multicopy stationery having staples affixed thereto at spaced intervals, said staples rising a few thousandths of an inch above the surface of the top sheet of the stationery, feeding mechanism comprising in combination a paper table for supporting the stationery, an endless belt, driving means for driving the belt, a plurality of fingers for engaging the staples in the stationery, said fingers being pivotally attached to the belt, a plurality of springs for causing the fingers to press the stationery against the paper table, instrumentalities for causing the fingers to disengage the staples, and a pressure roller for preventing undesirable bulging and buckling of the stationery.

FRED R. McMURRY.