To all whom it may concern:

Be it known that we, HORACE P. BROWN and CLARENCE L. JOHNSTON, both citizens of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Paper Folding and Interleaving Machines, of which the following is a specification.

This invention relates to paper folding and interleaving machines, and has for its object to provide a simple and improved means for receiving the paper from the folding and interleaving devices, compacting it and delivering it in a continuous pile to a distant point.

Generally stated, the invention comprises in combination with folding and interleaving devices, a series of rotatable spirally wound coils to receive the paper, a chute in which the paper is compressed by said rotatable coils and a conveyer beneath said chute to deliver the paper to a distant point.

One form which our invention may assume is exemplified in the following description and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of the device embodying our invention.

Fig. 2 shows a vertical sectional view of a portion of the same.

Fig. 3 shows a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 shows a diagram of the driving connections for the various parts.

Referring in detail to the form of our invention illustrated herewith, we have shown a pair of cooperating folding and interleaving cylinders 10 of the type shown and described in our copending application, Serial No. 53,726, filed October 2nd, 1915, wherein paper is fed from opposite sides in continuous webs 11, to be severed, folded and interleaved for whatever purpose desired. The paper is removed from the cylinders in folded and interleaved sheets 12 by means of oscillating stripper fingers 13, and it is for the purpose of receiving the folded sheets from the fingers, maintaining the same in proper interleaved arrangement and delivering them in compact continuous piles to a suitable receiving table 14 that we have devised the present mechanism.

This receiving, compacting and delivering mechanism comprises a series of rotatable 55 coils 15 beneath each cylinder, each made up of a spirally wound rod 16 surrounding a vertical shaft 17 and secured thereto by means of inwardly turned ends 18. The vertical shafts 17 of each series are journaled upon and supported by a frame bar 19 running longitudinally of the cylinders and are driven through beveled gearing 20 by means of a horizontal shaft 21 receiving motion from the adjacent cylinder driving gear 22 through an idler gear 23.

Between the adjacent coils of each series is a vertical guide 24 extending downwardly and turned at 25 to form a curved chute to receive the folded sheets. The bottom of 70 the chute terminates adjacent a conveyer 26, which conveyer extends to the receiving table 14 and runs over a roller 27, which is driven by means of a shaft 28 from the adjacent cylinder. The table 14 has endless 75 tapes or plates 29 traveling over its surface and cooperating with the conveyer 26, which tapes are driven also by the roller 27. The handling of tissue paper presents a difficult problem, as the paper is easily wrinkled 80 and for this reason the separate conveyers are rotated in different directions as illustrated by the arrows in Fig. 3 of the drawings. In each set or series of the conveyers the adjacent conveyers are rotated in opposite directions and this will insure that the leaves of paper will be drawn flat and the paper will be forced toward one side of the machine as fed down.

In the practical operation of the device 90 described the cylinders upon being rotated fold and interleave the sheets alternately, and the folded sheets are engaged by the stripper fingers and moved away from the cylinders. Each finger has a hook-shaped 95 projection 30 near its free end against which the folded edges of the sheets are thrust when the same are removed from the cylinders. The fingers moving downwardly retain the folded sheets until the upper ends of the adjacent rotating coils engage the sheets and move them downwardly between the spiral windings of the coils. In this way the sheets are always under control and are not released until properly packed and delivered. The curve in the chute will retard the movement of the folded sheets so that the coils will have to exert slight pressure to
move them and thus a packing of the sheets is obtained. The coils are timed in their rotation relative to the cylinders, so as to make one revolution to each sheet delivered by the adjacent cylinder and the conveyor being driven from the cylinders, is in timed relation therewith, so that the sheets are maintained in compact and continuous piles and delivered in this condition to the table for packaging and wrapping.

The hereinafter described mechanism offers the advantage of smooth, even and timed operation, and is of such construction as to eliminate all possibility of tearing or injuring the paper.

Various changes in the construction and arrangement of the several parts herein described may be employed without departing from the spirit of our invention, as disclosed in the appended claims.

Having thus described our invention, what we claim and desire to secure by Letters Patent is—

1. A delivery mechanism for a paper folding and interleaving device comprising rotatable, open, spiral coils forming paper receiving spaces extending substantially from the periphery to the center of the coils, said coils being arranged to directly receive between their convolutions the edges of separate folded severed and interleaved sheets, and a delivery device to receive the sheets from the said coils.

2. A delivery mechanism for a paper folding and interleaving device comprising opposite, rotatable open, spiral coils arranged to directly receive between their convolutions the edges of severed folded and interleaved sheets and a chute formed between said coils and extending beyond the same to receive the sheets therefrom.

3. A delivery mechanism for a paper folding and interleaving device comprising opposite rotatable, open, spiral coils arranged to directly receive between their convolutions, the edges of the severed folded and interleaved sheets and a chute formed between said coils and extending beyond the same to receive the folded sheets therefrom, said chute being curved to retard the sheets and cause the coils to pack the same and a conveyor arranged to receive the sheets from the coils.

4. A delivery mechanism for a paper folding and interleaving machine comprising stripping devices and a series of rotatable, open, spiral coils arranged beneath the stripping devices to directly receive between their convolutions the paper from the stripping devices, said spiral coils being arranged to move the paper downwardly and forming paper receiving spaces extending from the periphery to the center of the coils.

5. A delivery mechanism for a paper folding and interleaving machine having folding and interleaving cylinders, said delivery mechanism comprising stripping devices for said cylinders, a series of rotatable, open, spiral coils beneath said cylinders to receive directly between their convolutions the paper from the stripping devices and adapted to move the said paper downwardly and driving means for said coils connected to the cylinders.

6. A delivery mechanism for a paper folding and interleaving machine, having folding and interleaving cylinders, said delivery mechanism comprising stripping devices for said cylinders, a series of rotatable, spiral coils arranged beneath each cylinder to directly receive the paper from said stripping devices and move the same downwardly, driving means for said coils connected to the cylinders and a chute formed between the series of coils and extending below the same and curved to retard the movement of the folded sheets through the chute to permit the coils to compact the sheets.

7. A delivery mechanism for a paper folding and interleaving machine, having folding and interleaving cylinders, said delivery mechanism comprising stripping devices for said cylinders, a series of rotatable, spiral coils arranged beneath each cylinder to directly receive between their convolutions the paper from said stripping devices and move the said paper downwardly, driving means for said coils connected to the cylinders and a chute formed between the series of coils and extending below the same and curved, whereby the movement of the folded sheets through the chute is retarded to permit the coils to compact the sheets, and a conveyor beneath the chute to receive the paper therefrom, said conveyor being driven from the cylinders.

8. A delivery mechanism for a paper folding and interleaving machine, having a pair of folding and interleaving cylinders, said delivery mechanism comprising oscillating stripping fingers for each cylinder to move the folded sheets therefrom and carry the same away from the cylinders, hooks adjacent the ends of said fingers forming lower shoulders against which the edges of the sheets are thrust, whereby to retain the sheets in place thereon, a series of rotatable, open, spiral coils beneath each of said cylinders terminating below the lowermost position of the stripper fingers to directly engage the edges of the folded sheets and move the same downwardly between their spiral windings.

9. A delivery mechanism having a paper folding and interleaving device, having folding and interleaving cylinders for delivering folded and interleaved sheets of paper alternately, said delivery mechanism comprising a series of rotatable, open coils beneath each cylin-
der to directly receive the folded sheets between their convolutions, said coils comprising a relatively small shaft and a spiral wound rod surrounding the same and connected at its ends thereto and having its convolutions spaced from the said shaft, said coils forming paper receiving spaces extending from the periphery to substantially the center of the coils.

10. A delivery mechanism for a paper folding and interleaving machine, having a pair of folding and interleaving rollers, said delivery mechanism comprising means located beneath each roller to directly engage the folded edges of the sheets both above and below for conveying the same away from the rollers in a stack and for compressing them at the bottom of the stack.

11. A delivery mechanism for a paper folding device, comprising a rotatable, open, spiral coil to receive and directly engage the folded edges of the severed sheets between its convolutions and convey the same away from the folding device, said coils forming paper receiving spaces extending from the periphery to substantially the center of the coils.

12. A delivery mechanism for a paper folding device comprising a plurality of open spiral coils arranged to directly receive the opposite edges of the sheets between their convolutions and means for rotating the individual coils at each engaged edge of the sheets in opposite directions to maintain the sheets in a smooth condition.

13. A delivery mechanism for a paper folding and interleaving machine, having a pair of folding and interleaving cylinders and a series of rotatable, spiral coils arranged beneath each of the cylinders and arranged to directly receive the opposite edges of the paper between their convolutions and means for rotating the individual coils at each engaged edge of the paper in reverse directions for maintaining the paper in a smooth condition.

14. A delivery mechanism for a paper folding and interleaving machine, having a pair of folding and interleaving cylinders, said delivery mechanism comprising a series of rotatable, open, spiral coils arranged beneath each of the cylinders to directly receive the paper between their convolutions and means for rotating the adjacent coils of each, series in reverse directions for maintaining the paper in a smooth, flat condition.

15. A delivery mechanism for a paper holding and interleaving machine, having folding and interleaving cylinders, said delivery mechanism comprising stripping devices for said cylinders, a series of rotatable spiral coils arranged beneath each cylinder to directly receive the paper from the stripping devices and move the same downwardly, driving means for said coils, and a chute located beneath the series of coils and having extensions extending between the same for guiding the paper while it is being operated on by the coils, said chute arranging the sheets of paper in a stack and being curved to retard the movement of the sheets to compact the same at the bottom of the stack.

16. A delivery mechanism for a paper folding and interleaving device, comprising opposite rotatable open spiral coils, forming paper receiving spaces extending substantially from the periphery to the center of the coils, said coils being arranged to directly receive between their convolutions the edges of severed, folded and interleaved sheets, and a chute located beneath the coils and provided with extensions arranged between the coils for guiding the sheets while they are being operated on by the said coils.

17. A delivery mechanism for a paper folding and interleaving device, comprising opposite rotatable open spiral coils arranged to directly receive between their convolutions the edges of the severed, folded and interleaved sheets, the individual coils at each engaged edge of the sheets being rotated in reverse directions to maintain the sheets in a smooth condition, and a chute formed between said coils and extending below the same to receive the folded sheets therefrom, said chute being curved to retard the sheets and cause the coils to pack the same.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

HORACE P. BROWN.
CLARENCE L. JOHNSTON.

Witnesses:
A. F. Sousa,
R. C. Papworth.