H. M. BARBER.

SHEET ASSOCIATING AND FOLDING MACHINE.

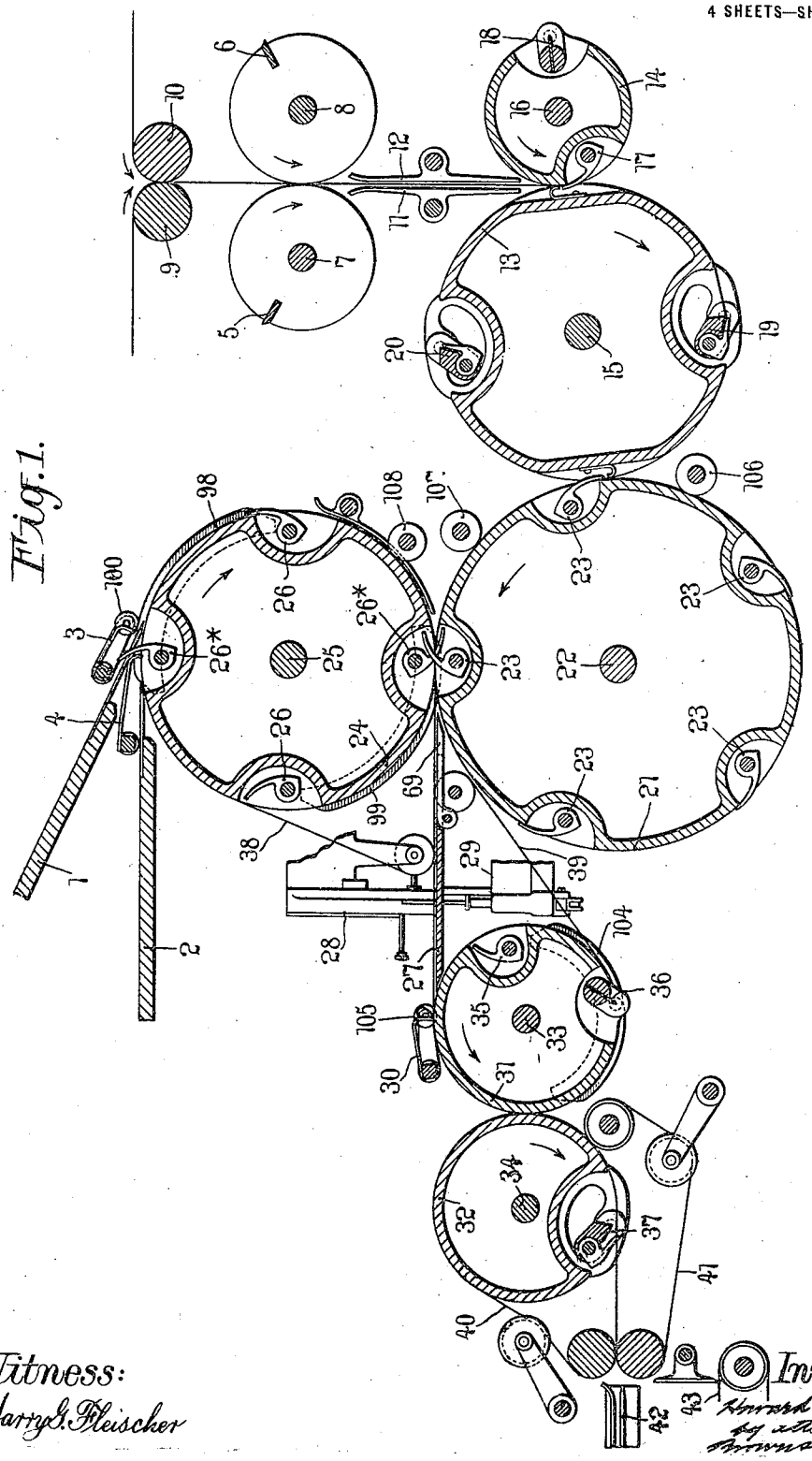
APPLICATION FILED AUG. 5, 1916.

1,269,039.

Patented June 11, 1918.

4 SHEETS—SHEET 1.

Fig. 1.



Witness:
Harry L. Fleischer

Inventor:
Howard M. Barber
by attorneys
Brown & Ward

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4 SHEETS—SHEET 2.

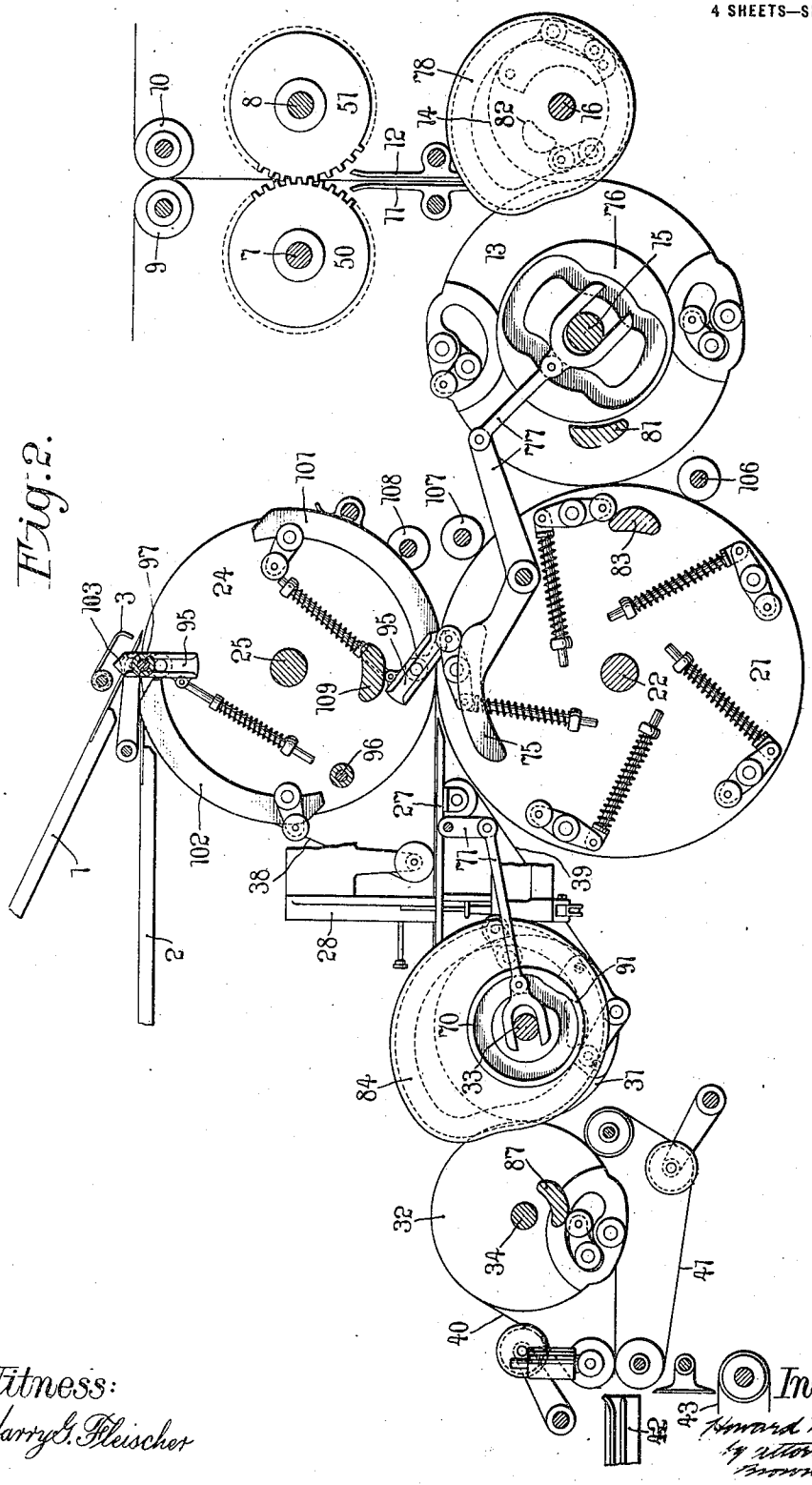


Fig. 2.

Witness:
Harry G. Fleischer

Inventor:
Howard M. Barber
by attorneys
Brown & Brown

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4 SHEETS—SHEET 3.

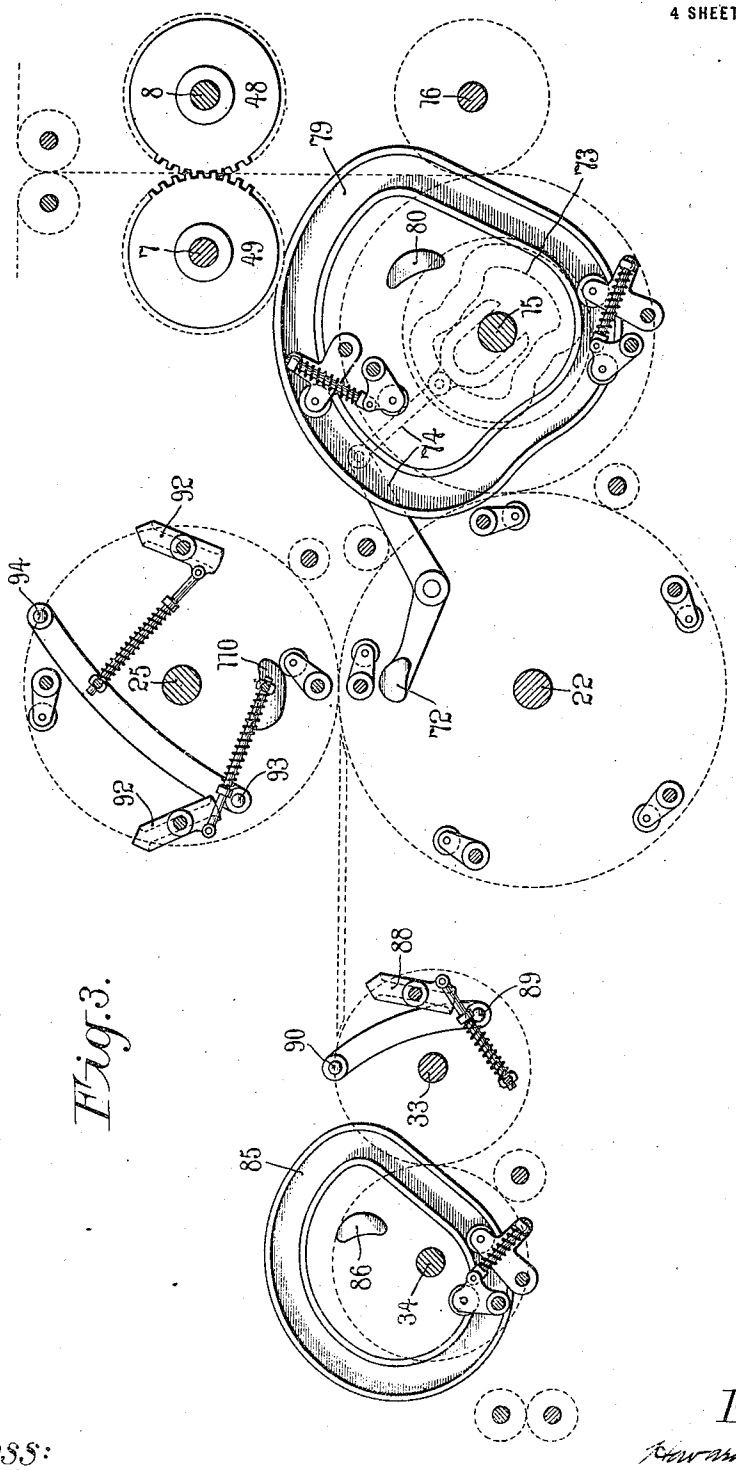


Fig. 3.

Witness:
Harry G. Fleischer

Inventor:
Howard M. Barber
by attorneys
Brownell & Ward

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4 SHEETS—SHEET 4.

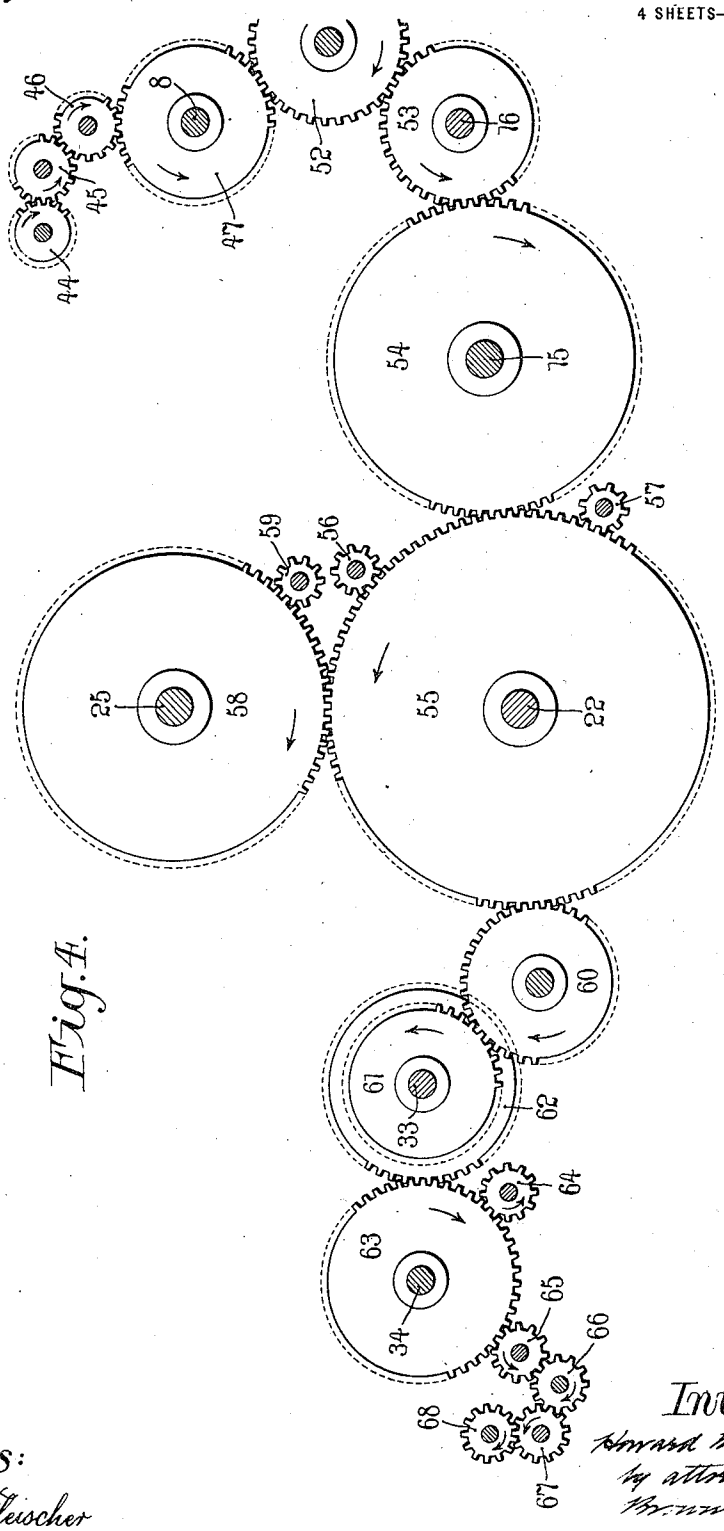


Fig. 4.

Witness:
Harry G. Fleischer

Inventor:
Howard M. Barber
by attorneys
Brown & Seward

UNITED STATES PATENT OFFICE.

HOWARD M. BARBER, OF STONINGTON, CONNECTICUT, ASSIGNOR TO C. B. COTTRELL & SONS COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

SHEET ASSOCIATING AND FOLDING MACHINE.

1,269,039. Specification of Letters Patent. Patented June 11, 1918.

Application filed August 5, 1916. Serial No. 113,367.

To all whom it may concern:

Be it known that I, HOWARD M. BARBER, a citizen of the United States, and resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Sheet Associating and Folding Machines, of which the following is a specification.

The object of this invention is to provide novel means for associating extra sheets fed from different sources of sheet supply, such, for instance, as cover and insert sheets, with a folded group of sheets fed from another source of supply, means preferably being employed for stitching the so associated sheets together and for folding the same.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a detail longitudinal vertical central section through so much of a sheet associating and folding machine as includes my invention,

Fig. 2 is a similar section taken just inside the near side frame,

Fig. 3 is a similar section taken just inside the far side frame, and

Fig. 4 is a similar section taken just outside the far side frame showing the geared connection between the several parts.

1 designates a source of extra sheet supply, such, for instance, as an insert sheet supply. 2 designates a different source of extra sheet supply, such, for instance, as a cover sheet supply.

These sources 1 and 2 are herein shown as feed tables, the table 1 being provided with a movable sheet stop 3 and the table 2 with a movable sheet stop 4.

Rotary cutters 5, 6, mounted on suitable shafts 7, 8, are arranged to cut a single web or a plurality of superimposed webs, which pass through the rolls 9, 10, into sheets, which sheets are passed downwardly between the guides 11, 12, and between the rotary coacting carriers 13, 14, mounted on shafts 15, 16, respectively. These carriers are arranged to coact to impart a transverse fold to the sheet or sheets. In the present instance, the rotary carrier 14 is provided with a set of grippers 17 and a folding blade 18, which blade is arranged to coact successively with the folding jaws 19, 20, on the rotary carrier 13.

A rotary associating carrier 21 mounted on a shaft 22 is herein shown as provided with an odd number of sets of grippers 23, five for instance.

A rotary transfer carrier 24 mounted on a shaft 25 is arranged to feed the extra sheets successively from the different sources of sheet supply 1 and 2 into position to be associated on the associating carrier 21 with the folded sheet or sheets from the rotary carrier 13. This rotary transfer carrier 24 is shown as having an even number of grippers, four for instance; two grippers 26 being arranged to take the sheets from the source of sheet supply 1 and two grippers 26* being arranged to take the sheets from the source of sheet supply 2.

A stitcher table 27 is arranged to receive the associated sheets where they are stitched transversely of their travel by the coacting parts 28, 29, of two or more stitchers. A movable stop 30 at the outer end of the stitcher table 27 is arranged in position to engage the advance edges of the associated sheets and hold them momentarily in position for the stitching operation.

Coacting rotary carriers 31, 32, mounted on their respective shafts 33, 34, are provided; the carrier 31 having a set of grippers 35 arranged to take the stitched, associated sheets from the stitcher table 27. This carrier 31 is also provided with a folding blade 36 arranged to coact with the folding jaws 37 on the rotary carrier 32 for imparting a transverse fold to the associated sheets along their transversely stitched line.

Endless carriers 38, 39, serve to carry the associated sheets onto and off from a stitcher table 27 and endless carriers 40, 41, are arranged to carry the product from the rotary carrier 32 to a suitable delivery 42, 43.

The train of gears designated by 44 to 68 inclusive, is operative to drive the parts at the proper relative speeds. In the present instance, the rotary carriers 13 and 14 are run at the same surface speed, the carrier 21 at a slightly greater surface speed and the carrier 24 at the same surface speed as the carrier 21. The carriers 31 and 32 rotate

one revolution to one revolution of the rotary carrier 14.

A switch 69 is located at the entrance end of the stitcher table 27, which switch is operated from a cam 70 on the shaft 33 of the rotary carrier 31 through the connection 71.

A movable cam 72 for opening the grippers 23 at the proper intervals to receive the sheet fed from the extra source of sheet supply 1 is controlled by a cam 73 on the shaft 15 of the rotary carrier 13 through the connection 74.

A movable cam 75 for releasing the grippers 23 at the proper intervals to deliver the associated sheets, is controlled by a cam 76, on the shaft 15 of the rotary carrier 13 through the connection 77.

The coacting folding mechanism on the carriers 13 and 14 is of the well known floating blade and jaw type, in which the cam 78 controls the blade 18 and the cams 79, 80, and 81, control the jaws 19 and 20.

A fixed cam 82 controls the grippers 17 of the rotary carrier 14 and a fixed cam 83 controls the grippers 23 of the rotary carrier 21 at the point where they receive the folded sheet or sheets from the rotary carrier 13.

The coacting folding mechanism of the rotary carriers 31, 32, is of the well known floating blade and jaw type, the operation of the blade 36 being controlled by the cam 84 and the operation of the jaws 37 being controlled by the cams 85, 86, 87.

The grippers 35 on the rotary carrier 31 are tumbler operated, the tumbler 88 being controlled by the pins 89, 90. The grippers 35 are opened to release the associated sheets at the time of folding, by the stationary cam 91.

The grippers 26, 26*, on the rotary carrier 24 are tumbler operated, the tumblers 92 for the grippers 26 being operated by the pins 93, 94, and the tumblers 95 of the grippers 26* being controlled by the pins 96, 97.

The movement of the sheet stop 3 is controlled by the cams 98, 99, arranged to successively engage the sheet stop roller 100 and the movement of the sheet stop 4 is controlled by cams 101, 102, arranged to successively engage the sheet stop roller 103.

The movement of the sheet stop 30 is controlled by the cam 104 which is arranged to engage the sheet stop roller 105.

Positively driven rollers 106, 107, bear against the surface of the rotary carrier 21 to hold the sheets in register thereon when the grippers are open and a positively driven roller 108 engages the surface of the rotary carrier 24 to hold the sheets in register thereon when their grippers are open.

A fixed cam 109 opens the grippers 26 to permit the sheets fed from the extra source of sheet supply 1 to be transferred to the grippers 23 of the associating carrier 21. A fixed cam 110 opens the grippers 26* to release the sheets fed from the extra source of sheet supply 2, for association with the folded group of sheets and the extra sheet fed from the source 1.

The mechanism is herein shown as arranged for association with a transversely once-folded sheet or sheets of an insert sheet fed from the source of supply 1 and a cover sheet fed from the source of supply 2 with the insert on one side of the folded sheet or sheets and the cover on the other side thereof.

The rolls 9, 10, are arranged to feed one or more webs to the rotary cutters 5, 6, where sheets are severed from the web or webs and fed through the guides 11, 12, to the coacting folding carriers 13, 14.

In the meantime, the rotary carrier 24 has taken an insert sheet from the source of supply 1 and fed it to one of the grippers 23 on the associating carrier 21. As this gripper 23, with its insert reaches a point between the carriers 21 and 13 the folded sheet or sheets is transferred from the carrier 13 to the carrier 21 on top of the insert sheet. As the associated insert and folded sheets reach a point between the carriers 24 and 21, a cover sheet, which has been taken from the source of sheet supply 2 by one of the grippers 26*, is placed on top of the folded sheet or sheets and the so associated cover, insert and interposed folded sheets are then fed forwardly onto the stitcher table 27, the switch 69 being thrown into position to insure the passage of the insert sheet with the others onto the said table. When these associated sheets reach the stop 30, the sheets are stitched transversely of their travel. The stop 30 is then raised and the advance edges of the sheets are grasped by the set of grippers 35 on the rotary carrier 31. The associated sheets are then folded off along their stitched line, transverse of their travel, onto the rotary carrier 32 and are delivered therefrom to the delivery mechanism 42, 43.

To secure a rapid delivery of the product, and, at the same time, give sufficient time for the proper stitching of the same, I have found a convenient arrangement to be the provision of two sets of insert transfer grippers alternating with two sets of cover transfer grippers on the rotary carrier 24; five sets of grippers 23 on the rotary carrier 21; two sets of folding jaws 19, 20, on the rotary carrier 13 coacting with a single folding blade 18 on the rotary carrier 14 and the provision of a single set of grippers 35 on the rotary carrier 31 and a single tucking blade 36 on the rotary carrier 31 coacting with a single set of folding jaws 37 on the rotary carrier 32.

It is obvious that the rotary carriers 13

14, can handle single sheets or a plurality of superimposed sheets fed from the rotary cutters 5, 6, and it is also obvious that the rotary carrier 24 can feed one sheet or a plurality of superimposed sheets from each of the different sources of sheet supply 1 and 2, without departing from the spirit and scope of my invention.

It is evident that changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the structure herein shown and described, but

What I claim is:

1. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, and means for stitching the so associated sheets together and delivering the same.

2. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, and means for folding the so associated sheets together and delivering the same.

3. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, and means for stitching and folding the so associated sheets together and delivering the same.

4. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, and a common means for feeding the cover and insert sheets to the associating means.

5. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, a common means for feeding the cover and insert sheets to the associating means, and means for stitching the so associated sheets together and delivering the same.

6. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, a common means for feeding the cover and insert sheets to the associating means, and means for folding the so associated sheets together and delivering the same.

7. Means for cutting and folding a main web sheet or sheets, means for associating cover and insert sheets fed from different sources with said folded sheet or sheets, a common means for feeding the cover and insert sheets to the associating means, and means for stitching and folding the so associated sheets together and delivering the same.

8. Means for folding a sheet or sheets, means for associating extra sheets fed from different sources with said folded sheet or sheets, a common means for feeding the extra sheets successively to the associating means, and means for folding the so associated sheets together and delivering the same.

9. Means for folding a sheet or sheets, means for associating extra sheets fed from different sources with said folded sheet or sheets, a common means for feeding the extra sheets successively to the associating means, and means for stitching and folding the so associated sheets together and delivering the same.

10. Rotary carriers arranged to fold a main web sheet or sheets and a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets.

11. Rotary carriers arranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets, and means for stitching the so associated sheets together and delivering the same.

12. Rotary carriers arranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets, and means for folding the so associated sheets together and delivering the same.

13. Rotary carriers arranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets, and means for stitching and folding the so associated sheets together and delivering the same.

14. Rotary carriers arranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets, and a rotary carrier arranged to feed the cover and insert sheets to the sheet associating carrier.

15. Rotary carriers arranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the cover and insert sheets to the sheet associating carrier, and means for stitching the so associated sheets together and delivering the same.

16. Rotary carriers arranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded

sheet or sheets, a rotary carrier arranged to feed the cover and insert sheets to the sheet associating carrier, and means for folding the so associated sheets together and delivering the same.

17. Rotary carriers arrranged to fold a main web sheet or sheets, a rotary carrier arranged to associate cover and insert sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the cover and insert sheets to the sheet associating carrier, and means for stitching and folding the so associated sheets together and delivering the same.

18. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, and a rotary carrier arranged to feed the extra sheets successively to the sheet associating carrier.

19. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the extra sheets successively to the sheet associating carrier, and means for stitching the so associated sheets together and delivering the same.

20. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the extra sheets successively to the sheet associating carrier, and means for folding the so associated sheets together and delivering the same.

21. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the extra sheets successively to the sheet associating carrier, and means for stitching and folding the so associated sheets together and delivering the same.

22. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, and a rotary carrier arranged to feed the extra sheets to the sheet associating carrier, the parts being so timed that the sheet associating carrier will first take an extra sheet, then the folded sheet or sheets and finally associate therewith another extra sheet.

23. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the extra sheets to the sheet associating carrier, the parts being so timed that the sheet associating carrier will first take an extra sheet, then the folded sheet or sheets and finally associate therewith another extra sheet, and means for stitching the so associated sheets together and delivering the same.

24. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the extra sheets to the sheet associating carrier, the parts being so timed that the sheet associating carrier will first take an extra sheet, then the folded sheet or sheets and finally associate therewith another extra sheet, and means for folding the so associated sheets together and delivering the same.

25. Rotary carriers arranged to fold a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to feed the extra sheets to the sheet associating carrier, the parts being so timed that the sheet associating carrier will first take an extra sheet, then the folded sheet or sheets and finally associate therewith another extra sheet, and means for stitching and folding the so associated sheets together and delivering the same.

26. Means for folding a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, and a rotary carrier arranged to take the extra sheets at different points on the carrier and feed them to the associating carrier at different times.

27. Means for folding a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to take the extra sheets at different points on the carrier and feed them to the associating carrier at different times, and means for stitching the so associated sheets together and delivering the same.

28. Means for folding a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to take the extra sheets at different points on the carrier and feed them to the associating carrier at different times, and means for folding the so associated sheets together and delivering the same.

29. Means for folding a sheet or sheets, a rotary carrier arranged to associate extra sheets fed from different sources with the folded sheet or sheets, a rotary carrier arranged to take the extra sheets at different points on the carrier and feed them to the associating carrier at different times, and means for stitching and folding the so asso-

ciated sheets together and delivering the same.

30. Means for folding a sheet or sheets, a rotary carrier having an odd number of surfaces upon which extra sheets fed from different sources are associated with each folded sheet or sheets, and a rotary carrier having an even number of surfaces on which the extra sheets are taken in succession from the different sources and from which they are fed at different times to the associating carrier to be associated thereon with each folded sheet or sheets.

31. Means for folding a sheet or sheets, a rotary carrier having an odd number of surfaces upon which extra sheets fed from different sources are associated with each folded sheet or sheets, a rotary carrier having an even number of surfaces on which the extra sheets are taken in succession from the different sources and from which they are fed at different times to the associating carrier to be associated thereon with each folded sheet or sheets, and means for stitching the so associated sheets together and delivering the same.

32. Means for folding a sheet or sheets, a rotary carrier having an odd number of surfaces upon which extra sheets fed from different sources are associated with each folded sheet or sheets, a rotary carrier having an even number of surfaces on which the extra sheets are taken in succession from the different sources and from which they are fed at different times to the associating carrier to be associated thereon with each folded sheet or sheets, and means for folding the so associated sheets together and delivering the same.

33. Means for folding a sheet or sheets, a rotary carrier having an odd number of surfaces upon which extra sheets fed from different sources are associated with each folded sheet or sheets, a rotary carrier having an even number of surfaces on which the extra sheets are taken in succession from different sources and from which they are fed at different times to the associating carrier to be associated thereon with each folded sheet or sheets, and means for stitching and folding the so associated sheets together and delivering the same.

34. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets and for feeding the same to the associating carrier, and a common means arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets.

35. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets and for feeding the same to the associating carrier, a common means arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets, and means for stitching the so associated sheets together and delivering the same.

36. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets and for feeding the same to the associating carrier, a common means arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet of sheets, and means for folding the so associated sheets together and delivering the same.

37. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets and for feeding the same to the associating carrier, a common means arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets, and means for stitching and folding the so associated sheets together and delivering the same.

38. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets, and for feeding the same to the associating carrier, and a single rotary carrier arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets.

39. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets, and for feeding the same to the associating carrier, a single rotary carrier arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets, and means for stitching the so associated sheets together and delivering the same.

40. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets, and for feeding the same to the associating carrier, a

single rotary carrier arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets, and means for folding the so associated sheets together and delivering the same.

41. A source of main sheet supply, different sources of extra sheet supply, a rotary sheet associating carrier, means for folding a main sheet or sheets, and for feeding the same to the associating carrier, a single rotary carrier arranged to take the extra sheets successively from the different sources of extra sheet supply and transfer them successively to the associating carrier to be combined with the folded sheet or sheets, and means for stitching and folding the so associated sheets together and delivering the same.

In testimony, that I claim the foregoing as my invention, I have signed my name this third day of August, 1916.

HOWARD M. BARBER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."