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Brown et al.

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[54] **JOGGER FOR PLURAL BIN RECEIVER**

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[52] **U.S. Cl.** **271/221;** 271/173

[51] **Int. Cl.²** **B65H 31/38**

[58] **Field of Search** 271/221, 222, 173, 64; 214/65

[56] **References Cited**

UNITED STATES PATENTS

1,448,301	3/1923	Hotchkiss	271/221
3,356,362	12/1967	Mestre	271/173
3,388,907	6/1968	Snellman et al.	271/222
3,658,324	4/1972	Snellman	271/222
3,774,906	11/1973	Fagan et al.	271/64

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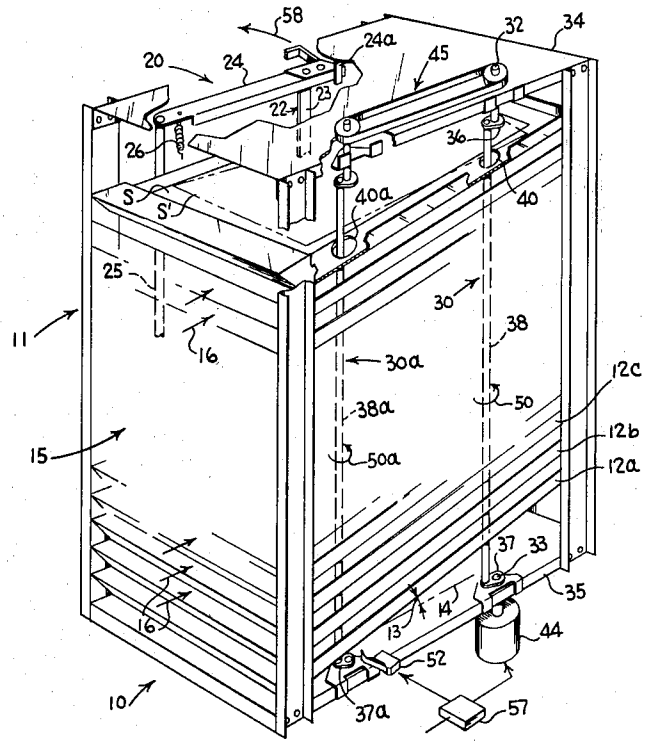
[57] **ABSTRACT**

A paper jogger integrated with a collating device or the like wherein a plurality of sheet collations are simultaneously longitudinally and laterally jogged towards mutually registered positions. Elongated jogging members are employed which extend along one side edge of the collated sheets and which are adapted to be orbited in a path so as to swingably engage the said side edges of the sheets and thereby longitudinally and laterally urge the latter towards engagement with opposed stationary aligning surfaces. In this manner not only may the sheets in each collation be aligned with one another in superimposed relation but also the various collations may be located in the same corresponding positions adjacent one side of the bin assembly for ease of withdrawal from the bins. This two-way jogging action may be carried out after a new sheet is added to all the collations and/or after completion of the formation of all the collations, and is terminated when said elongated members are disposed in a position such that they do not interfere with the subsequent feeding of additional sheets into the collator bins.

3 Claims, 3 Drawing Figures



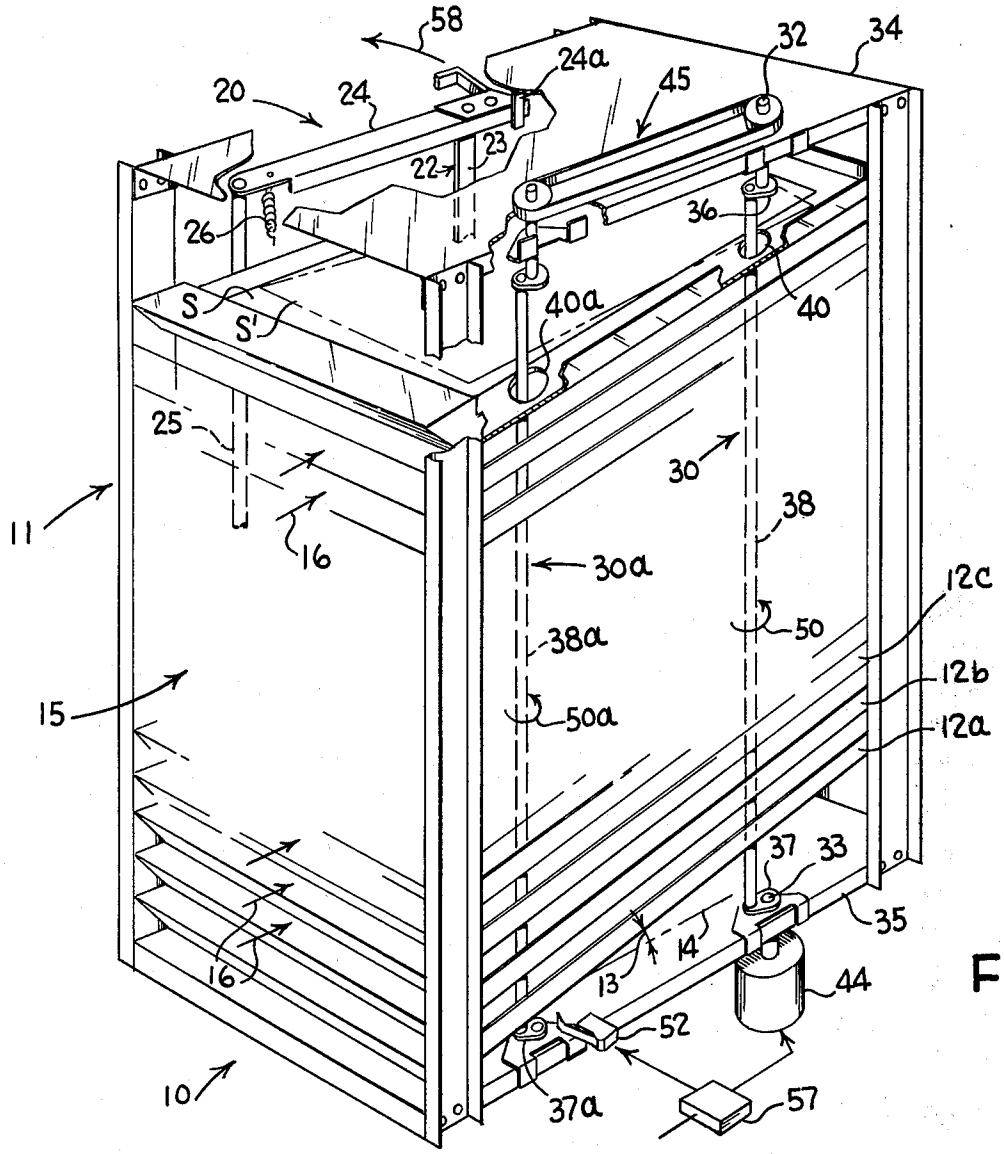


FIG. 1

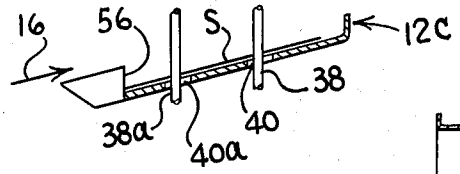


FIG. 3

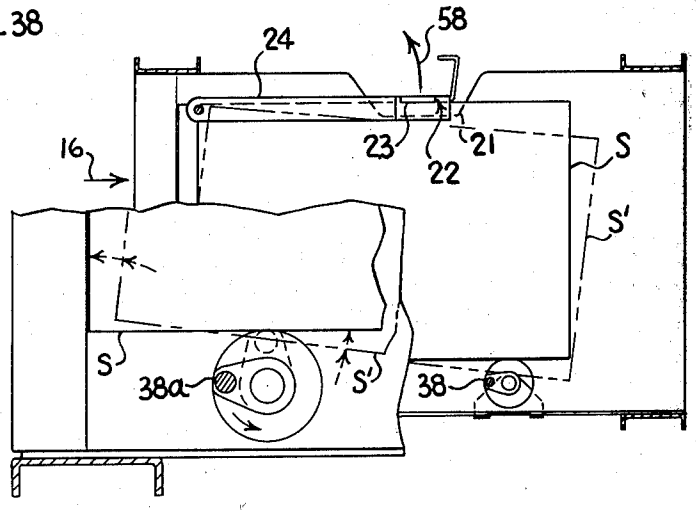


FIG. 2

JOGGER FOR PLURAL BIN RECEIVER

BACKGROUND OF THE INVENTION

In the operation of a sheet collating machine it is most desirable to have the sheets in each collation in lateral and longitudinal registered condition when the collations are ready for removal from the sheet associating machine. Further, it is desirable to have the finished jogged collation in a position where it can be easily grasped by the machine operator and removed from the machine. However, in conventional sheet associating machines, sorting devices and the like wherein sheets are sequentially fed to a plurality of individual shelves or bins, the sheets that accumulate in each bin do not always come to rest in exactly overlying or mutually registered condition. Provision of both longitudinal and lateral jogging and locating actions for the collated sheets heretofore proved difficult principally because of the high degree of inaccessibility of the sheets due to the relatively high physical density of bins, plates, guides, struts and other elements normally associated with a collator bin assembly.

SUMMARY OF THE INVENTION

The instant sheet associating device is provided with a plurality of inclined and closely vertically spaced bins, and a paper jogging means which extends through the various bins and is adapted to engage one side edge of all the sheets in said bins and urge said sheets towards engagement with opposed stationary aligning surfaces that are disposed adjacent to other sides of said sheets whereby all the sheets become mutually registered and located in a predetermined position in the bins. Each collator bin is constructed and arranged so that some of said aligning surfaces are movable to inoperative positions to allow removal of the sheet collations and so that the direction of withdrawal of each jogged collation from its associated bin is substantially normal to the direction in which the sheets making up said collation are fed into said bin.

It is the primary object of the instant invention to provide a novel collator bin and jogger combination whereby several collations may be registered and located in a predetermined manner so as to make possible the efficient subsequent handling thereof.

A further object of the invention is to provide a simplified bin and two-way sheet jogging arrangement whereby collated sheets may be laterally and longitudinally urged towards a plurality of cooperating stationary sheet aligning surfaces.

In the drawings:

FIG. 1 is a perspective view illustrating the arrangement of the apparatus embodying the instant invention.

FIG. 2 is a plan view, partially enlarged, illustrating the nature of the details of the drive means for the instant orbiting sheet jogging members.

FIG. 3 is a sketch illustrating the construction and inclined disposition of the sheet receiving bins of the instant collating device.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. 1 the instant bin and sheet jogging combination is embodied in a sheet associating machine, the sheet receiving bin assembly of said machine being generally indicated at **10.** In that the construction of bin assembly **10** is conventional (except as is otherwise hereinafter described) only a very general description thereof will be made here. Assembly **10** includes a box-like frame **11** on which is mounted a plurality of closely spaced sheet receiving shelves or bins **12***a*, 12*b*, 12*c*, etc., the plane of each of these bins being disposed at a small angle **13** with respect to a horizontal plane **14.** Sheets of paper or other material are fed into the respective bins by any suitable sheet transport means (not shown) located at the sheet entry end **15** of said assembly **10** as is indicated by the arrows **16.** This loading of the individual bins is accomplished in most cases by the delivery sheets into one bin after another in vertical sequence, and by this progressive distribution of sheets to the successive bins **12** sheet collations are thereby generated in each of said bins.

At any time during the sequential feeding of sheets into the bins it may be desired to laterally and longitudinally jog the sheets in each bin so that said sheets become aligned with one another in mutual superimposed relation. To this end the farther side **20,** as seen in FIG. **1,** of the bin assembly **10** and the corresponding side of each individual bin **12** are made open, i.e., there are no obstructing frame members or side plates for each bin on said side **20** which interfere with the easy manual lateral withdrawal of sheet collations from the respective bins **12.** Further the bottom plate portion of each bin **12** is formed with a lateral recess indicated at **21** of FIG. **2;** these recesses being vertically aligned along said side **20** so as to be capable of receiving therein an elongated vertically disposed and normally stationary abutment post **22** having an inner vertically extending sheet aligning surface **23.** The post **22** is swingably mounted in gate-like fashion on the bin frame by means of an upper arm **24** and a corresponding lower arm (not shown), which arms are secured to a vertical shaft **25** that is pivotally supported on the bin assembly **10** in any suitable manner. A spring **26** is provided for biasing said post and arm arrangement **22, 24** to the normal closed or stationary position illustrated in FIGS. **1** and **2** wherein said vertical aligning surface **23** is disposed closely adjacent to the inner edges of said tray recesses **21** thereby providing a stop and aligning edge for effectively determining the lateral positionment of the collated sheets at said side **20** of bin assembly **10.** The normal position shown for the post **22** is determined by engagement of arm **24** with a suitable stop **24***a*, FIG. **1,** carried by the bin assembly **10.**

The apparatus for jogging the sheets in bins **12** comprises a pair of crank means **30, 30***a*. Crank means **30** includes upper and lower axially aligned shafts **32** and **33** that are rotatably mounted in suitable bearings secured to the upper and lower bin frame members **34** and **35** respectively. Crank arms **36** and **37** are secured to shafts **32** and **33** respectively and have their outer ends interconnected by a vertically disposed crank rod **38** that extends through enlarged vertically aligned circular holes or openings such as **40** formed in the bottom plate portion of each bin or shelf **12.** The crank assembly **30** is adapted to be driven by an electric motor **44** that is coupled to shaft **33** while the crank assembly **30***a*, which is constructed and arranged in a manner similar to that just described for assembly **30,** is adapted to be driven from crank assembly **30** through any suitable conventional type belt and pulley arrangement **45.** The orbital movement of the crank rod **38,** as indicated by arrow **50,** is in phase with the corresponding motion **50***a* of rod **38***a*. An electrical switch **52** is

suitably mounted on the machine frame in a position so as to be momentarily actuated by a portion of the swinging movement of the outer end of the crank arm **37***a;* this operation of switch **52** serving to control the de-energizing of the motor **44** so that the crank rods **38,** 38*a* will terminate their orbital motions when in positions farthest away from said side **20** of the bin assembly **10.** In this way the crank rods will normally be located so as not to interfere with the feeding of sheets into one or more of the bins **12.**

During operation of the instant sheet associating machine sheets to be collated are successively fed into said bins as indicated by arrows **16.** As each sheet arrives in a bin it will tend to come to rest by sliding slightly downwardly under the action of gravity towards the lower front vertical abutment wall **56** of the bin as illustrated in FIG. **3,** so that the entire lower edge of the sheet engages said wall **56.** This longitudinal positionment of each sheet in its associated bin is not assured however in that any given sheet either may not slide all the way down into engagement with wall **56** and/or it may become slightly skewed with no part thereof, or perhaps only one corner thereof, contacting wall **56** as is indicated by the dotted lines S^1 of FIG. **2.** It will be seen then as sheets accumulate in each bin they may not come to rest in either lateral or longitudinal overlying alignment with the next lower sheet in the bin and hence will need to be jogged lengthwise and sidewise into positions of mutual registry, as denoted by the solid lines S, in order to produce a desired even-edged collation prior to the time of withdrawal of such collations from the bin. This two-way jogging action is accomplished by initiating operation of motor **44** at a time when the feeding of sheets into the bins is interrupted. Operation of motor **44** serves to cause crank rods **38** and **38***a* to partake of their counter-clockwise (as seen in FIG. **1**) orbital movement **50, 50***a*, the effective radius and location of this orbital movement being such as to cause said rods **38, 38***a* to engage the adjacent side edges of all the sheets in all the bins and reorient and urge the same towards both the sheet aligning surface **23** of said post **22** and towards the respective lower front walls, such as **56,** of said bins. This lateral and longitudinal jogging action of the crank rods tends to finally position all the sheets in all the bins in mutual registry wherein the entire front edge of each sheet is in engagement with the front wall of the associated bin and the side edge of each sheet is in lateral engagement, or very close to such engagement, with the lateral aligning post surface **23.** The driving of crank rods **38, 38***a* may be terminated by operation of said switch **52** after either one revolution of the crank assemblies or after several such revolutions as optionally determined by a suitable control circuit **57.** This control circuit may be conventional in nature and need not be further described here.

When the generation and jogging of the various collations in the respective bins has been completed the lateral aligning post **22** may be manually swung, as indicated by arrow **58,** to an open position so that all the collations which are now jogged and disposed adjacent the said side **20** of the bin assembly are very accessible. The side edges of these collations are most exposed in the region of said bin recesses **21** which facilitates the grasping and lateral withdrawal of the collations by the machine operator. It will be noted that the direction of withdrawal of the collations from the bins is substantially normal to the direction in which the sheets are fed (**16**) into the bins, this arrangement allowing the machine operator to stay effectively on one side of the equipment while operating the latter. After removal of the various collations the post **22** may be spring urged to its said normal closed or stationary position preparatory for the next series of sheet associating and jogging operations.

The instant bin and sheet jogging arrangement thus affords an efficient means for the production of laterally and longitudinally registered collations, these jogged collations additionally being advantageously located at the side of said bin assembly for ease of manual withdrawal.

What is claimed is:

1. A collating machine: comprising

a frame;

a plurality of vertically spaced sheet receiving bins carried by said frame;

each of said bins having a sheet receiving end, and each being inclined upwardly and rearwardly from said sheet receiving end thereof;

a longitudinal sheet abutment means positioned along the said sheet receiving end of each of said bins;

a common lateral sheet abutment means carried by said frame and extending substantially vertically along one side of each of said bins, said lateral sheet abutment means being pivotably biased about a pivot for movement towards and away from said side of said bins to allow for easy access to each bin;

said lateral and longitudinal abutment means respectively normally defining lateral and longitudinal limits for movements of sheets in said bins;

said bins having a series of aligned apertures formed therein;

a common crank rod extending through said apertures so as to be capable of engaging the edges of sheets in said bins;

means mounting said crank rod for orbital movement in said aperture so as to be capable of engaging and urging sheets in said bins towards said longitudinal and lateral sheet abutment means and thereby into mutual registry; and

drive means for operating said crank rod.

2. Apparatus as defined by claim **1** wherein a second series of bin apertures and a second crank rod are provided which are similar to said first mentioned apertures and crank rod; and wherein a belt and pulley drive arrangement is operatively connected between said crank rods.

3. A collating machine: comprising

a frame;

a plurality of vertically spaced sheet receiving bins carried by said frame;

each of said bins having a sheet receiving end, and each being inclined upwardly and rearwardly from said sheet receiving end thereof;

a longitudinal sheet abutment means positioned along the said sheet receiving end of each of said bins;

a common lateral sheet abutment means carried by said frame and extending substantially vertically along one side of each of said bins;

means for mounting said lateral abutment means for movement towards and away from said side of said bins;

said lateral and longitudinal abutment means respectively normally defining lateral and longitudinal limits for movements of sheets in said bins;

said bins having two rows of aligned apertures formed therein;

a pair of common crank rods extending substantially parallel to each other and each extending through one of said rows of apertures so as to be capable of engaging the sheets in said bins at two separate points along one edge thereof;

means mounting each of said crank rods for orbital movement in said apertures so as to be capable of engaging and urging sheets in said bins towards said longitudinal and lateral sheet abutment means and thereby into mutual registry; and

drive means for operating said crank rods.

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