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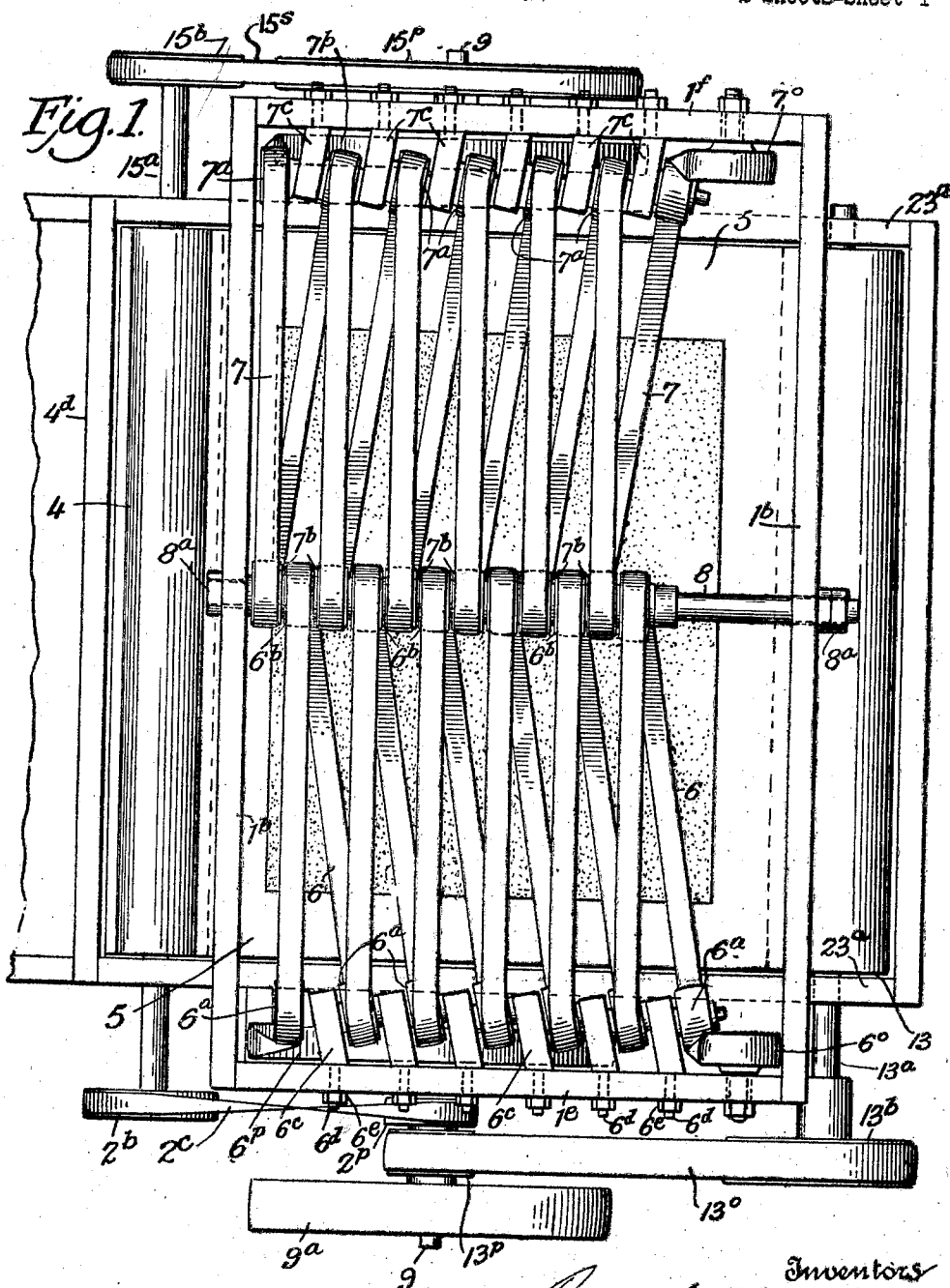
B. F. UPHAM ET AL

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BRONZING MACHINE

Filed June 8, 1922

2 Sheets-Sheet 1



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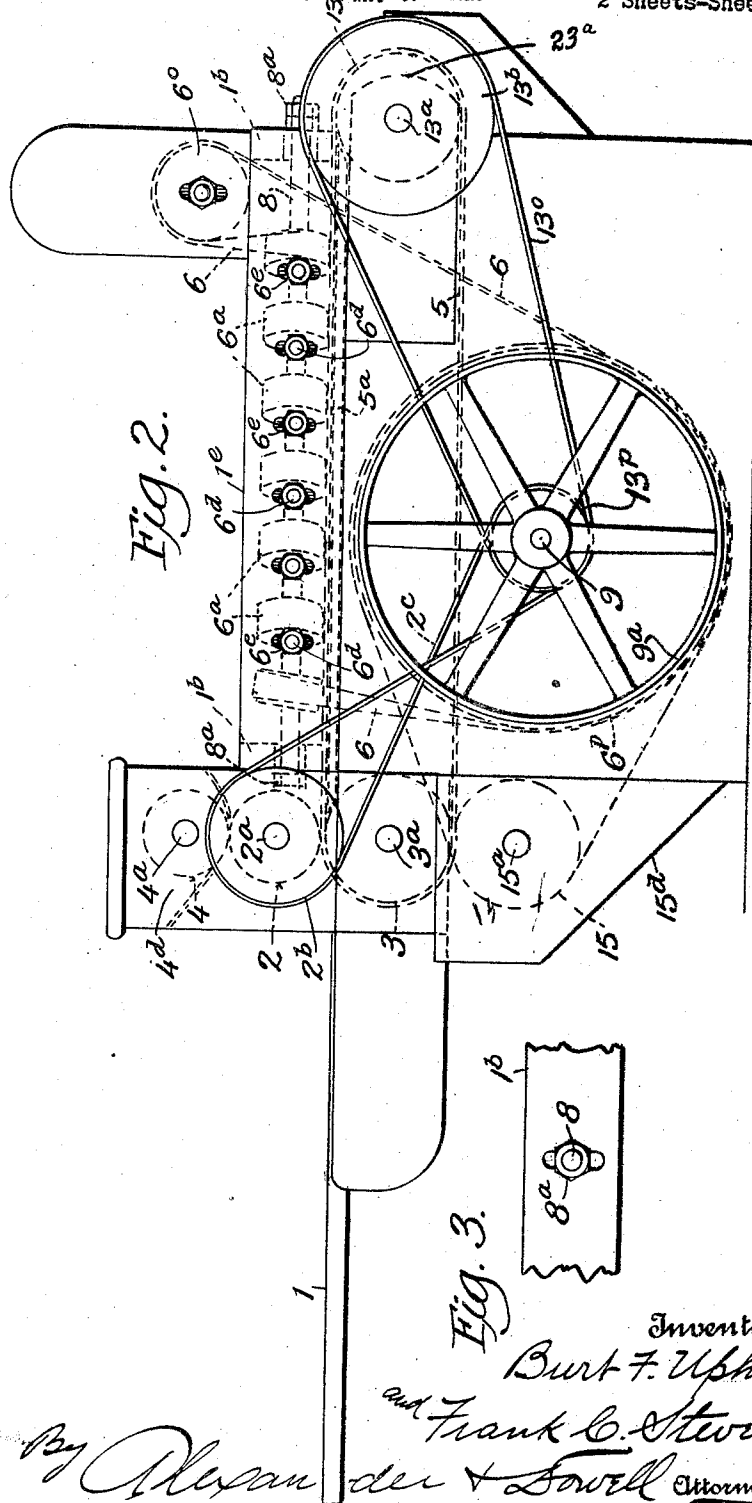


Fig. 3.

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UNITED STATES PATENT OFFICE.

BURT F. UPHAM, OF BROOKLINE, AND FRANK C. STEVENS, OF COHASSET, MASSACHUSETTS, ASSIGNORS TO UNITED PRINTING MACHINERY COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

BRONZING MACHINE.

Application filed June 8, 1922. Serial No. 568,778.

To all whom it may concern:

Be it known that we, BURT F. UPHAM and FRANK C. STEVENS, citizens of the United States, said Upham residing at Brookline, in the county of Norfolk and State of Massachusetts, and said Stevens residing at Cohasset, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Bronzing Machines; and we hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in so-called bronzing machines, and its object is to provide a very simple machine by which sheets will be smoothed out and wrinkles removed; and may be carried through the machine without the use of grippers; and by which the bronzing may be thoroughly effected.

Another object is to provide a bronzing machine wherein grippers for holding the sheets on the conveyor or carrier during the bronzing operation are not required.

Another object is to provide a simple, small, efficient bronzing machine which can be used in connection with, or as an attachment to, small printing presses.

Another object of the invention is to enable the sheet conveyor to be readily withdrawn from the machine when desired, to permit ready access to the various belts for adjustment or cleaning thereof.

A further object is to provide a novel arrangement of endless polishing belts whereby a series of endless belts may be employed instead of a multiple of short belts.

The invention includes novel means whereby the sheets, as they are conveyed through the machine are smoothed out, and novel means whereby bronze powders or the like will be properly applied to the sheets during the passage of the sheets through the machine.

The accompanying drawings diagrammatically illustrate a bronzing machine constituting one embodiment of the invention, which we will explain with reference thereto, and summarize in the claims the essentials of the invention, and novel features of construction and novel combinations of

parts, for all of which protection is desired.

In the drawings:

Fig. 1 is a conventional top plan view of a form of bronzing machine embodying the invention.

Fig. 2 is a conventional side elevation of such machine.

Fig. 3 is a detail showing the fastenings of shaft 8.

As illustrated in the drawings the sheets may be fed by hand from a table 1 to and between a feed roll 2, and a coating underlying cylinder 3. Roll 2 is mounted on a shaft 2^a journaled in bearings on the side frames of the machine; cylinder 3 is mounted on a shaft 3^a which may be journaled in bearings on the side frames, or as herein-after explained.

Bronze or other powder may be supplied to roll 2 by any suitable means. In the drawings a hopper 4^a is shown above the roll 2, and in the hopper is a roller 4, mounted on a shaft 4^a, adapted to supply the powder to the feed roll 2 by which it is fed onto the sheets, as they pass between the roll 2 and cylinder 3.

The sheets are carried forward from the cylinder 3 by a suitable conveyor. In the machine shown the conveyor is preferably an endless belt 5 which runs over the cylinder 3 and over a like cylinder 13 mounted on a shaft 13^a; the sheets being laid upon the upper side of the conveyor. If desired, the upper side of the conveyor may be supported by an underlying platform supported on the frame of the machine; this platform prevents the upper side of the conveyor sagging between the cylinders 3 and 13.

Beneath the cylinder 3 is a suitable cleaning roll 15 mounted on a shaft 15^a journaled in bearings on the side frames of the machine; this roll 15 is adapted to remove any powder that may adhere to the conveyor; such powder being deposited in a receptacle or hopper 15^a. The powder is applied to the upper side of a sheet as it passes under the feed roll 2 and onto the upper run of the conveyor 5.

After passing the feed roll 2 and while lying on the upper side of the conveyor 5 the sheet is subjected to the action of a series of smoothing and rubbing and polishing belts or belt sections 6 and 7. The portions

of said belts which engage the surface of the sheet are preferably arranged at obtuse angles to the line of travel of the sheet, and the sheet engaging parts of the belts or belt sections 6 and 7 are also preferably arranged at an obtuse angle to each other and to the median line of the conveyor. The opposed belts or belt sections 6 and 7 preferably diverge from the center median line of the belt 5, or converge toward the median thereof as shown in Fig. 1.

By this arrangement of belts 6 and 7 the sheet is smoothed out or lightly rubbed outwardly from its center towards the opposite sides thereof as it moves under the belts 6 and 7, with the effect, in practice, that all irregularities and wrinkles in the sheet are smoothed out. Furthermore the powder applied to the sheets is rubbed and polished by belts 6 and 7 in a most efficient manner.

By having the belts diverge, as shown in Fig. 1, they will not interfere with the forward movement of the sheet, and at the same time act to not only prevent any wrinkles forming in the sheet during the rubbing operation, but also to smooth out any previously formed wrinkles in the sheet.

In the construction shown all the belts or belt sections 6 are preferably integral parts of a single endless belt; and all the belts or belt sections 7 also integral parts of a like single endless belt. The belt 6 runs over a series of pulleys 6^a at one side of the machine, and a series of pulleys 6^b at the center of the machine; while the belt 7 runs over a series of pulleys 7^a at the opposite side of the machine and over pulleys 7^b at the center of the machine. The pulleys 6^b and 7^b alternate and may be conveniently supported by, and loosely mounted upon, a horizontal shaft 8 lying above the longitudinal median line of the conveyor and having its ends supported in cross bars 1^b of the main frame. The shaft 8 may be vertically adjustable in any suitable manner; as by having its ends passed through vertical slots in the cross bars 1^b of the frame and fastened thereto by nuts 8^a, as shown in Figure 3.

Each pulley 6^a and 7^a may be, and preferably is, made vertically adjustable in any suitable way. As shown each pulley 6^a is mounted on a spindle or stud on a block 6^c attached to a side bar 1^c of the main frame; and block 6^c has a bar or stud 6^d which extends vertically through a slot in the bar 1^c and is secured by a nut 6^e. Thus the pulley 6^a can be independently adjusted up or down. Similarly, each pulley 7^a is attached to a block 7^c adjustably attached to a side bar 1^c of the main frame at the opposite side of the machine.

The endless belt 6 leads from a pulley 6^a on a shaft 9, journaled in the main frame, up over the pulley 6^a nearest the feed roll;

then to and over the pulley 6^b nearest the feed roll; then diagonally across the top run of the conveyor to the second pulley 6^a; then straight back to the second pulley 6^b; then diagonally back to the next pulley 6^a; and so on, until it reaches the last pulley 6^a farthest removed from the feed roll, whence it passes up and over an idler pulley 6^a journaled on a stud attached to the frame of the machine and thence down to the drive pulley 6^a.

Similarly, the endless belt 7 is driven from a pulley 7^a on the shaft 9, such belt leading from the pulley 7^a up over the pulley 7^a nearest the feed roll, then over the pulley 7^b nearest the feed roll on shaft 8, then back to the next pulley 7^a; from which it passes to and over an idler pulley 7^a; and thence returns to the drive pulley 7^a.

The idler pulleys 6^a and 7^a are preferably mounted so as to be vertically adjustable so that either can be adjusted to tension the related belt 6 or 7 as desired.

The shaft 9 is the main shaft, and may be driven in any suitable manner. As shown it is provided with a drive pulley 9^a which may be belted to any suitable driver. The feed roll 2 may be driven by pulleys 2^b and cross belt 2^c from a pulley 2^a on shaft 9. The conveyor 5 may be driven by means of a pulley 13^b and belt 13^c from a pulley 13^a on shaft 9. The cleaning roll 15 may be driven by pulleys 15^b and belt 15^c from a pulley 15^a on shaft 9.

Preferably the bearings of shafts 3^a and 13^a of the cylinders 3 and 13 are mounted on side bars 23^a of a frame which can be slid horizontally out of or into the main frame so that when it is desired to clean the conveyor or the belts 6 and 7, the frame carrying the cylinders 3 and 13 can be drawn out from beneath the sets of horizontal loops of the belts 6 and 7.

In operation a sheet of paper is fed between the feed roller 2 and cylinder 3 onto the conveyor 5 and is supplied with powder from the hopper 4^a as it passes between the rollers 2 and the cylinder 3, the sheet having been previously printed or impressed so that powder will adhere to the design impressed thereon. As the sheet is carried forward by the conveyor it comes in contact with the outwardly moving surfaces of the lower runs of the horizontal belts or loops of belts 6 and 7 above the conveyor, which smooth and straighten out the sheet by lightly rubbing opposite portions of its surface in opposite directions, and also rub the powder upon the sheet and remove any surplus powder which might adhere thereto; and after passing the belts the sheet is discharged from the conveyor over the cylinder 13 onto any suitable receiver.

The number of belts or loops of belts 6

and 7 in the opposite series of belts may be varied in accordance with the size of the machine and the amount of work intended to be done thereby; and while we prefer to form all the loops in each series out of one continuous belt it is obvious that a plurality of separate belts might be employed; and we consider one the equivalent of the other in the broader aspects of the invention. It is obvious that many changes may be made in the form, the arrangement and operation of parts within the scope of the invention, and we do not consider it restricted to the particular combination or arrangement of parts shown; as the drawings merely diagrammatically and conventionally illustrate a machine, but will, with the foregoing explanation, enable others skilled in the art to readily adapt and use the invention.

These machines can be made quite small, and in small machines no grippers are required to handle the sheets, although grippers can be employed in connection with the endless conveyor if desired. The machines can be used for smoothing out crinkled sheets of paper when it is not desired to bronze the same; such bronzing machines of small size can be readily adapted to handle the sheets as they come from the press.

What I claim is:

1. In a machine of the character specified, a sheet conveyor, and belts arranged at obtuse angles to the line of movement of the sheets adapted to operate upon the sheets as they move forward on the conveyor.

2. In a machine of the character specified, a sheet conveyor, and oppositely moving belts disposed at obtuse angles on opposite sides of the line of movement of the sheets adapted to simultaneously operate upon the sheets as they are moved by the conveyor and assist in forwarding the sheets.

3. In a machine as set forth in claim 2, the belts being arranged at obtuse angles to the line of movement of the sheets on the conveyor.

4. In a bronzing machine, a sheet conveyor, means for applying powder to the sheets and belts arranged at obtuse angles to the direction of movement of the conveyor and adapted to smooth out and rub the sheets as they are moved forward by the conveyor.

5. In a bronzing machine, a sheet conveyor, means for applying powder to the sheets, opposite belts arranged at obtuse angles to each other and at obtuse angles to the direction of movement of the conveyor, adapted to smooth out and rub the sheets as they move forward on the conveyor.

6. In a machine of the character specified, a sheet conveyor, belts moving in opposite directions and disposed at opposite sides of the line of movement of the sheet, and ar-

ranged at obtuse angles to each other, adapted to simultaneously operate upon the sheets as they are carried forward on the conveyor.

7. In a machine as set forth in claim 5, an endless belt conveyor for the sheets.

8. In a machine as set forth in claim 6, an endless belt for conveying the sheets.

9. In combination, an endless belt conveyor for sheets, means for applying powder to the sheets, opposite endless belts arranged at obtuse angles to each other and at obtuse angles to the direction of movement of the conveyor, adapted to smooth out the sheets and rub the bronze as the sheets are carried forward by the conveyor.

10. In a machine of the character specified, an endless belt conveyor for sheets, means for applying powder to the sheets, opposed sets of substantially parallel belts moving in opposite directions and disposed at opposite sides of the longitudinal median line of the conveyor, the sets being arranged at obtuse angles to each other, said belts being adapted to simultaneously operate upon the sheets as they are carried forward on the conveyor.

11. In a machine of the character specified, a sheet conveyor, belts, guides for each belt disposed above the path of the sheet whereby each belt is caused to make a plurality of substantially parallel loops above the sheets, the portions of each belt at the underside of said loops being adapted to operate upon the sheets as they are moved by the conveyor, substantially as described.

12. In a machine as set forth in claim 11, means for applying powder to the sheets before reaching the belts.

13. In a bronzing machine, a sheet conveyor, means for applying powder to the sheets, sets of opposed belts and guides for each belt disposed above the path of the sheet whereby each belt is caused to make a plurality of substantially parallel loops above the sheets, the portions of each belt at the underside of said loops being adapted to operate upon the sheets as they are moved by the conveyor, substantially as described.

14. In a bronzing machine as set forth in claim 13, the sheet conveyor comprising an endless belt upon which the sheets are laid and carried past the bronze applying means and beneath the obtuse runs of the belts.

15. In a machine of the character specified, a sheet conveyor, an endless belt, guides for the belt disposed above the path of the sheet, whereby the belt is caused to make a plurality of substantially parallel loops above the conveyor, the underside of each loop lying at an obtuse angle to the line of movement of the sheets, and the lower portions of the belt in each loop thereof being adapted to operate upon the sheets as they are moved by the conveyor.

16. In a machine as set forth in claim 15,

the sheet conveyor comprising an endless belt upon which the sheets are laid and carried beneath the obtuse runs of the belt.

17. In a bronzing machine, a sheet conveyor, means for applying powder to the sheets, a pair of endless belts, guides for the belts disposed above the path of the sheet whereby each belt is caused to make a plurality of substantially parallel loops above the conveyor, the loops of one belt being arranged at an obtuse angle to the like loops of the other belt, and the underside of each such loop lying at an obtuse angle to the line of movement of the sheets, and the lower

portions of the belts on such loop thereof being adapted to operate upon the sheets as they are moved thereby on the conveyor. 15

18. In a bronzing machine as set forth in claim 17, the sheet conveyor comprising an endless belt upon which the sheets are laid and carried past the powder applying means, and beneath the obtuse runs of the belt. 20

In testimony that we claim the foregoing as our own, we affix our signatures.

BURT F. UPHAM.
FRANK C. STEVENS.