Aug. 15, 1967 F. PREUSS 3,336,026

SHEET FEEDING ARRANGEMENT FOR A SHEET PRINTING MACHINE

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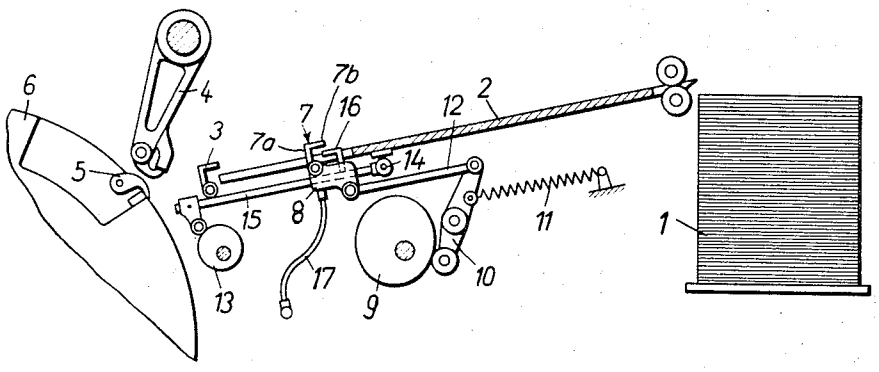

Fig.1

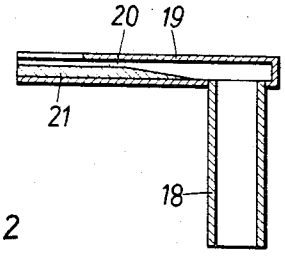

Fig. 2

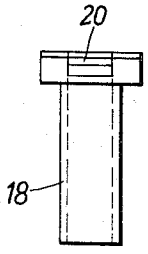

Fig. 3

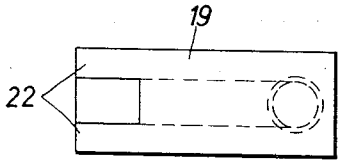

Fig. 4

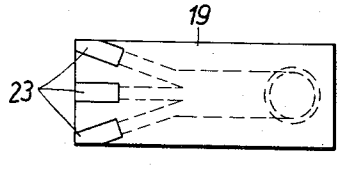

Fig. 5

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SHEET FEEDING ARRANGEMENT FOR A SHEET PRINTING MACHINE

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5 Claims. (Cl. 271—14)

The invention relates to a device for introducing a blanket under the cover means of a sheet aligning device of a sheet printing press, in which a suction nozzle moved longitudinally of the sheet path and below the plane of the sheet applies suction to the sheet in the vicinity of a sheet edge and introduces it below the cover means. In such devices, the suction nozzle has to be operated with high vacuum in order to be able to reliably engage the edge regions of sheets of heavy card which may lie in a wavy manner. However, this leads to considerable difficulties in the handling of thin porous paper, since the suction also acts through the pores onto the next sheet, so that the normal sheet transport of single sheets is disturbed. This is especially disadvantageous in connection with the advance straightening of sheets fed in stacked form to the printing press. A further disadvantage occurs, since the suction nozzle operates below the sheet plane and its suction openings must accordingly be upwardly open. In the periodic rest periods during return movement of the suction nozzle, foreign bodies adhering to the sheets, more particularly powder, fall into the suction nozzle, so that it rapidly becomes blocked and has to be cleaned at short intervals.

It is an object of the invention to avoid all of these disadvantages by the use of a nozzle which is known per se and which is based on the suction action of a stream of compressed air. Such nozzle is not likely to be clogged by powder particles. Moreover, the suction action tends to separate several sheets from each other.

It is a further object of the invention to provide a device in which the nozzle is so formed that the direction of the air stream emerging from the nozzle is parallel to the plane of the sheet and runs in the direction towards the sheet edge. Accordingly, especially in connection with use of the nozzle in sheet feeding devices with stacked sheet conveyance, it is avoided that the emerging air lifts the sheets and thus brings the sheet stack into disorder. The air emerges on the shortest path at the region of the sheet to be sucked and in the direction of the suction movement. The same advantage occurs in use of the nozzle for guiding a sheet under the cover means and against the abutment of a lateral mark.

The above and other objects and advantages of the invention will be clear from the following description taken with reference to the accompanying diagrammatic drawings which are given by way of example and in which:

FIG. 1 is a side elevation of the feed table of a sheet printing press;

FIG. 2 is a longitudinal sectional view of a blast suction nozzle;

FIG. 3 is an end elevation of the nozzle of FIG. 2;

FIG. 4 is a plan view of the nozzle of FIG. 2; and

FIG. 5 is a plan view of a modified nozzle.

The sheets are fed from a stack **1** in known manner over a feed table **2** to front edge guides or front lays **3**, from where they are taken over in the aligned condition by a swing gripper **4** and are then transferred to grippers **5** of a printing cylinder **6**. Additional likewise known preliminary stops **7** are provided which, below the sheet fed to the printing cylinder **6** by the gripper **4**, slow down the next succeeding sheet and feed it in

the aligned condition to the front lays **3**. The preliminary stops **7** are arranged on a slide **8** which is moved forward and backwards by means of a cam disc **9**, a roller lever **10**, a spring **11** and a rod **12** in accordance with the cycle of the press on a guide **15** which can be raised and lowered about a bearing **14** by means of a cam disc **13**.

The preliminary aligning means shown as stops **7** are pivotally mounted on reciprocating slide **8** and comprise a generally L-shaped portion. One arm **7***a* of this portion protrudes above the level of the table in the illustrated position of the stop and the other arm **7***b* extends in said position parallel to the table and in opposition to the direction of travel of the sheets thereby forming a cover portion. Slide **8** further mounts a suction means **16**. This suction means includes a nozzle **19** connected by a stud **18** and a hose **17** to a suitable source of pressurized air (not shown). The nozzle extends generally parallel to the plane of table **2**. As can best be seen in FIG. 2 the nozzle includes a guide member **21** which extends below a discharged opening **20** to guide the air stream emerging from the nozzle. The air stream is further laterally guided by guides **22** as is shown in FIG. 4. As is evident, the air stream discharged from the nozzle arrangement according to FIG. 4 is shaped somewhat in the manner of a ribbon.

FIG. 5 shows a modified nozzle **16***a* in which the air stream is divided into three diverging streams by appropriately oriented guides **23**.

As is evident from the previous description, successive sheets will travel on table **2** from the right towards the left. When the leading edge of a sheet approaches stops **7**, the suction or sub-atmospheric pressure automatically and continuously generated just above the ribbon like air flow parallel to table **2** and flowing toward edge guides or front lays **3** will pull the leading edge of the sheet downwardly and thus below cover portion **7***b*. Accordingly, the sheet is forced to align itself by abutment of its leading edge against stop portion **7***a*. As is also evident, the pulling of the leading edge of sheets below cover portion **7***b* prevents that sheets will slide over stops **7** and eventually also over edge guides **3**. Similarly, if a stream of shingled or overlapping sheets is fed, carrying along of a sheet to be aligned by adhesion of its leading end to the trailing end of the proceeding sheet already gripped by swing gripper **4** is effectively prevented.

As has been previously expalined, slide **8** and with it stops **7** and suction means **16** are moved in the direction of travel of the sheet. During such travel the sheets are gradually slowed down and also aligned. At the end of the travel of slide **8**, stops **7** are pivoted out of the way in a conventional fashion. The preliminarily aligned sheets now reach edge guides **3** where the final alignment occurs and the sheets are stopped. Gripper **4** then transfers the stopped and aligned sheets in a conventional manner to cylinder **6** and grippers **5** thereof.

I claim:

1. A sheet-feeding device of a sheet-printing press to which sheets are successivley fed from a stack of sheets, said sheet-feeding device comprising, in combination:

a feed table for guiding the sheets from the stack to the press;

a sheet-aligning means engageable with the leading edge of a sheet moving on said table toward the press, said aligning means having a portion adapted to protrude above the level of the table and terminating in a cover portion extending in opposition to the direction of travel of the sheet on the table;

a nozzle means disposed substantially parallel to the plane of the table, said nozzle means being connect-

ible to a supply of compressed air for producing a stream of air, the suction generated by said stream adjacent thereto sucking the leading edge of the sheet on the table below the cover portion and into engagement with said protuding portion of the aligning means;

and reciprocating support means for said aligning means and said nozzle means, said support means including a slide mounting said aligning means and said nozzle means, and guide and drive means reciprocating said slide parallel to the plane of the table for controlling the speed of movement of the sheet in reference to the table and aligning the sheet against said protruding portion of the aligning means.

2. A sheet-feeding device according to claim **1**, wherein said nozzle means includes lengthwise internal guide means for directing said air stream parallel to the plane of the table and toward the leading sheet edge when said edge has passed said nozzle means on its way to the aligning means.

3. A sheet-feeding device according to claim **2**, wherein said nozzle means includes further lengthwise internal guide means for limiting the width of the air flowing through the nozzle means.

4. A sheet-feeding device according to claim **1**, wherein said nozzle means includes guide means defining several divergent ducts for dividing the air flowing through the nozzle means into several divergent air streams.

5. A sheet-feeding device according to claim **1**, wherein said protruding portion of the aligning means is generally L-shaped one arm of the L-shaped portion being normal to the plane of the table and the other facing in the direction of travel of sheet on the table.

References Cited

UNITED STATES PATENTS

1,595,478	8/1926	Minton.	
2,317,993	5/1943	Harrold	271—53
2,613,930	10/1952	Backhouse	271—60
3,158,367	11/1964	Tarbuck	271—26

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