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MATRIX DELIVERY MECHANISM FOR TYPOGRAPHICAL LINE COMPOSING MACHINES

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Fig. 1

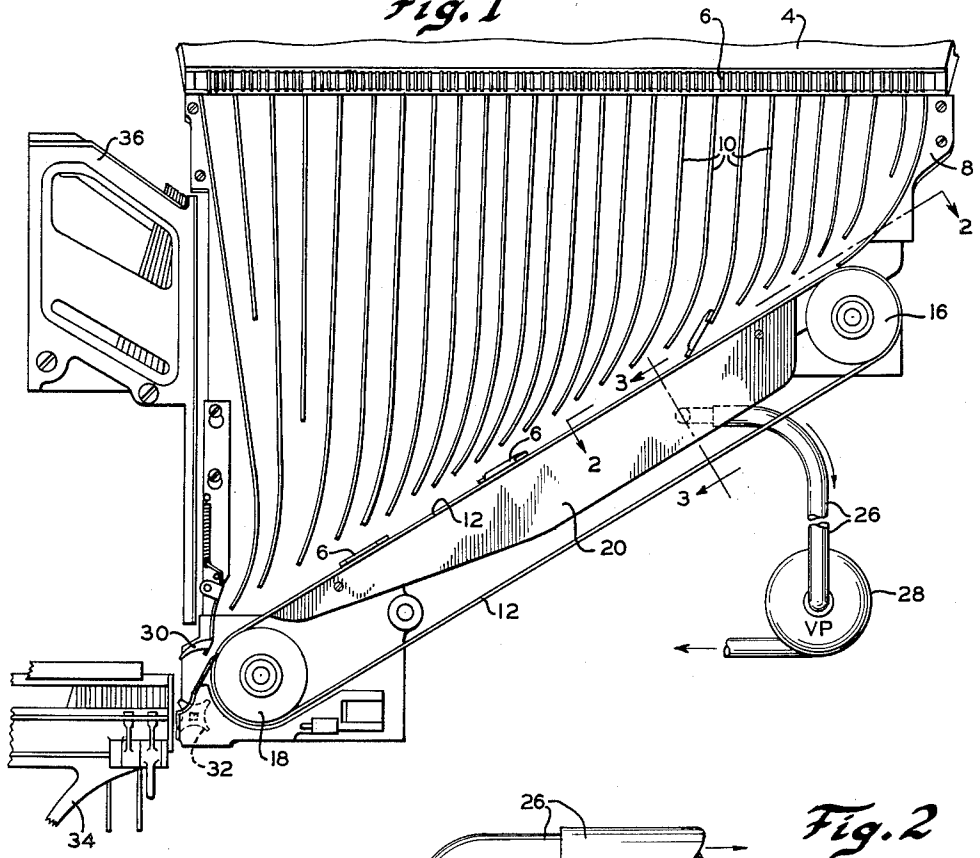
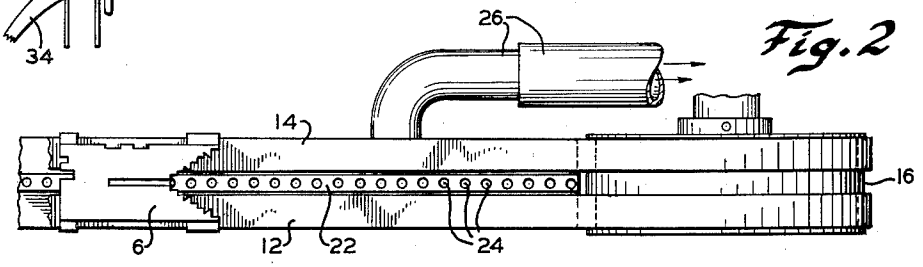


Fig. 2



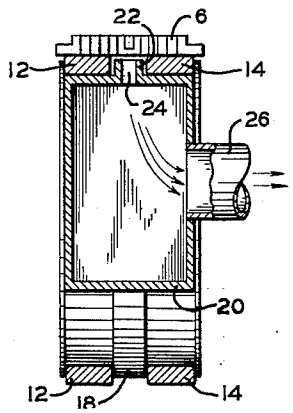


Fig. 3

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MATRIX DELIVERY MECHANISM FOR TYPOGRAPHICAL LINE COMPOSING MACHINES

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This invention relates to typographical machines of the class wherein matrices are stored in inclined magazines from which they may be selectively released and gravitate through a vertically partitioned passageway onto the upper stretch of a constantly moving endless belt which delivers them to an assembler mechanism by which they are driven into an assembly elevator after which the characters on said matrices are reproduced either by casting a type bar or by photography.

This invention is particularly adapted to machines wherein the release of matrices is effected by automatic mechanism such as the well known Teletypesetter composing machine operating unit which is capable of releasing matrices at a much greater frequency than by hand operation of the usual keyboard.

In order to derive the full benefit of the high speed operation of which the high speed Teletypesetter operating unit is capable, it is necessary to accelerate the speed of all the composing machine components including the matrix delivery belt. However, it has been found that when the matrix delivery belt speed is increased, transposition of matrices occurs more frequently. One reason for this malfunction is the matrices, when released, fall from a common horizontal plane and fall different distances and, therefore, the matrix velocities vary whereas the belt velocity is constant. It has been observed that this difference in velocities has caused some matrices to bounce when they strike the belt and consequently they frequently do not attain belt velocity until they are entering the assembler. Furthermore, it has been found that even though a matrix lands flat on the belt it does not attain belt velocity for some time because of slippage which will vary according to the different weights of matrices.

According to the present invention a pair of spaced narrow belts are provided, in place of the usual full width single belt, and a vacuum chamber is disposed beneath the upper stretch of the belts in such manner as to provide a support therefor. Also, the vacuum chamber is provided with a raised rail portion which is disposed between the two belts and serves as a separating guide. The guide rail is provided with holes in communication with the vacuum chamber and thus, when vacuum pressure is applied, the matrices are drawn against the belts and attain belt velocity very quickly thus greatly reducing the frequency of transpositions. Furthermore, by causing matrices to attain belt velocity quickly, the likelihood of spaceband transpositions is very greatly reduced.

The required vacuum pressure may be conveniently provided by connecting the vacuum chamber to the intake side of the usual mold cooling blower of a line casting machine or by providing a suction pump for a photographic composing machine.

In view of the foregoing, it is the principal object of the present invention to provide means for reducing time lag and slippage of matrices on the assembler belt of a line casting machine to enable more rapid matrix assembly.

Another object of the present invention is to minimize the frequency of matrix transpositions during composition.

A further object of the present invention is to minimize

the frequency of spaceband transpositions during composition.

Other objects and structural details will be apparent from the following description when read in conjunction with the accompanying drawings wherein:

FIG. 1 is a fragmentary front elevational view of the arrangement of the present invention in relation to the usual assembler front and assembly elevator of a line composing machine.

FIG. 2 is a fragmentary plan view taken on line 2—2 of FIG. 1 and shows the disposition of the vacuum-chamber suction holes in relation to a matrix and the matrix delivery belts of the present invention.

FIG. 3 is a fragmentary sectional view taken on line 3—3 of FIG. 1 and shows the relationship between a matrix and the vacuum chamber and matrix transporting belts of the present invention.

Referring to FIG. 1, a magazine **4** containing matrices **6** is disposed above and aligned with an assembler front **8** having vertically disposed spaced partitions **10** the lower ends of which are curved to the left. Below the lower ends of partitions **10** is a pair of endless belts **12** and **14** mounted in space relation upon a pair of grooved pulleys **16** and **18** said pulleys being adapted to rotate constantly while the machine is in operation.

Immediately below the upper stretch of belts **12** and **14** is a vacuum chamber **20** which is so constructed and disposed as to provide a support for the upper stretches of the belts. As may be seen in FIGS. 2 and 3, the upper surface of vacuum chamber **20** is provided with a raised rail **22** which is disposed between and serves to separate the belts **12** and **14**. The upper surface of rail **22** is so disposed, in a plane beneath the upper surface of belts **12** and **14**, that it will not contact the body portion of a matrix **6** while it is being transported by said belts. The rail **22** is provided with a plurality of air passages **24** in communication with vacuum chamber **20** which is, in turn, connected by a conduit **26** to a suction pump **28**.

Also shown in FIG. 1 is a usual matrix deflector plate **30**, a star wheel **32**, an assembly elevator **34** and a spaceband box **36**.

Operation

When matrices **6** are selectively released from magazine **4** they gravitate through assembler front **8** and are guided and deflected by partitions **10** onto the upper stretches of belts **12** and **14** which are continuously moving from right to left toward the assembly elevator.

When the machine is running, suction pump **28** creates vacuum pressure in chamber **20** thereby causing air to be drawn through passages **24** at a high velocity. As the matrices **6** engage the belts **12** and **14**, upon leaving partitions **10**, the air being drawn through the passages **24** in rail **22** will draw said matrices into engagement with belts **12** and **14** and, as the belts transport the matrices to the left toward the assembly elevator **34**, the air being drawn through the successive passages **24** will tend to hold the matrices in firm contact with the belts. By virtue of the present invention, whereby matrices are drawn quickly into engagement with the belts, said matrices attain belt velocity much more quickly than when gravity alone is relied upon and, therefore, the probability of transposition of matrices is substantially reduced. Also, by virtue of the present invention the possibility of spaceband transposition is minimized.

While there is above described but one embodiment of the invention, it is possible to produce still other embodiments without departure from the inventive concept above disclosed and it is, therefore, desired that only such limitations shall be imposed on the appended claims as are stated therein or may be required by prior art.

What I claim is:

1. In a tape-controlled, high speed typographical composing machine, the combination of a magazine containing matrices which are selectively released therefrom, an assembler front extending downwardly from said magazine and having generally vertical passages of different lengths opening, at the bottom of said front, at successively spaced apart locations and adapted to have the selectively released matrices fall therethrough, an assembler, conveyor means moving along an inclined path under the bottom of said front to said assembler to carry the matrices to the latter in the order in which the matrices are selectively released, and means creating a positive air pressure differential between the pressures respectively above and below said conveyor means along at least the portion of the latter passing under the passages of said front remote from said assembler so that matrices falling onto said conveyor means through said passages remote from the assembler are made to adhere to the conveyor means for avoiding rebounding and slipping of such matrices relative to the conveyor means and thereby preventing transposition on the conveyor means of matrices released successively from passages of said front opening at different locations along the conveyor means.

2. In a typographical composing machine; the combination as in claim 1, wherein said conveyor includes at least one endless belt guided to have an upper run along said inclined path, and wherein said means creating a positive air pressure differential includes a rail extending along side of, and slightly below said upper run of the conveyor, said rail having upwardly opening orifices therein, and means applying a suction to said orifices to cause a downward flow of air into the latter.

3. In a typographical composing machine; the combination as in claim 1, wherein said conveyor means includes a pair of parallel, laterally spaced apart endless belts guided to have upper runs along said inclined path, and wherein said means creating a positive air pressure differential includes a rail disposed between said upper runs at a level slightly below the latter and having upwardly opening orifices, and means applying a suction to said orifices to cause a downward flow of air into the latter.

4. In a typographical composing machine; the combination as in claim 3, further comprising a vacuum chamber extending below said upper runs and supporting the latter, and wherein said rails extends from the upper portion of said chamber and has said orifices in communication with the interior of said chamber, and said suction applying means includes a vacuum pump connected to said chamber.

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