

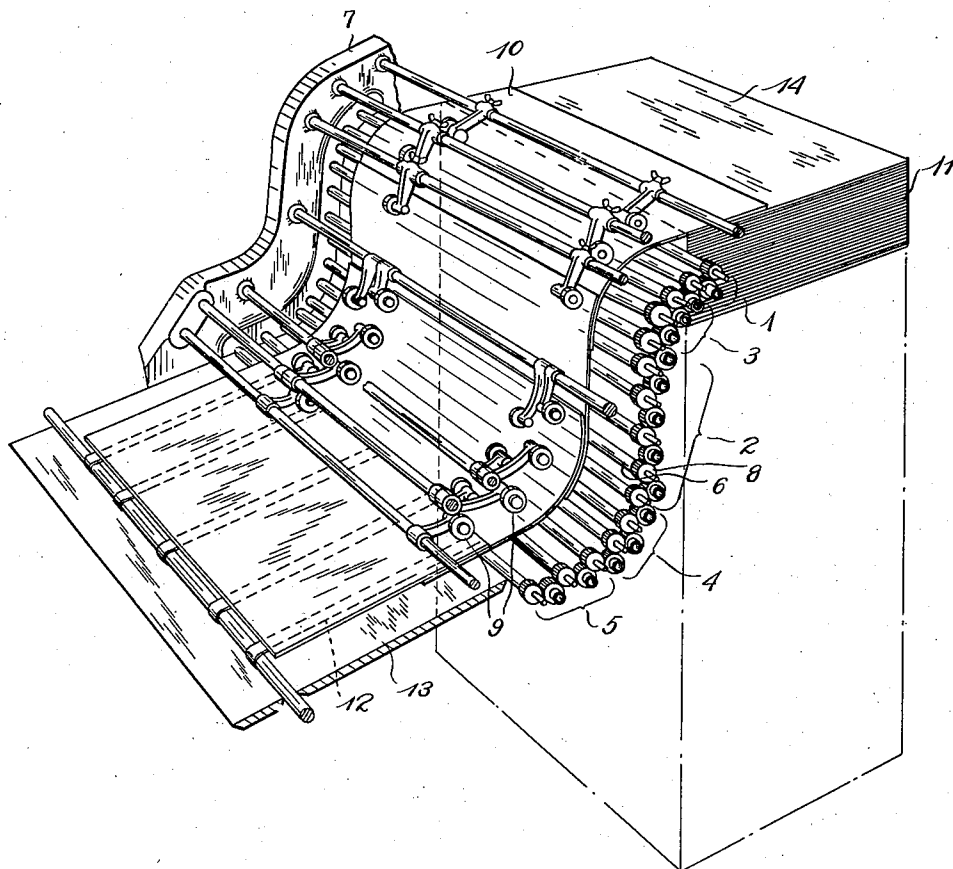
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2,201,605

SHEET CONVEYER

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SHEET CONVEYER

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5 Claims. (Cl. 271-51)

The invention consists in improvements in or relating to conveyers for sheets of paper or like sheet material and has reference to conveyers of the kind used for conveying sheets of paper, card or other sheet material from a separator arranged to separate individual sheets from a pile, to a printing or other sheet manipulating machine. The invention is concerned particularly with conveyers in which the sheets are conveyed as a continuous stream of partly overlapping sheets.

Printing and other sheet-manipulating machines are frequently so constructed that it is necessary to supply the sheets to them at one level from a pile the top of which is at a different level, for example when the feed board is at a low level it is an advantage to use a pile of sheets of considerable height in order to lessen the loss of time caused by stoppages for renewing the pile. It is an object of the present invention to provide a conveyer which may be used in such a case for conveying separated sheets from a pile of substantial height to a sheet manipulating machine at a low level, which occupies little floor space and which provides, where necessary, positive control of the sheets being conveyed.

The invention consists in a conveyer for the above purpose characterized in that while the top end portion of the conveyer is horizontal or has only such a slope that the sheets may be transferred to it from the pile without undue bending of the sheets, the main portion of the conveyer or part of it has a considerably greater slope which may even reach the vertical, the change in slope being arranged to avoid undue bending of the sheets at that place, and also characterized by means for positively maintaining the sheets in contact with the part of greater slope.

The bottom end portion of the conveyer may be horizontal or it may have only such a slope that the sheets may be controlled and registered in the normal way and in one form of the invention this portion has a length at least equal to that of the sheets to be conveyed, considered in the conveying direction. In this case also the change of slope is so arranged as to avoid undue bending of the sheets. The top end portion also may have a length at least equal to that of the sheets.

In one preferred form of the invention, which is illustrated by way of example in the accompanying diagrammatic drawing, the conveying surface of the top end 1 of the conveyer, of the intermediate portion 2 of greater slope, of the parts 3 and 4 of the conveyer where the slope changes and of a portion 5 of the bottom end of

the conveyer, is constituted by a series of axially parallel rollers 6 extending across the conveyer and supported at each end in frame members 7 (only one of these members being shown in the drawing). The rollers at the part 3 of the conveyer are arranged around an arc of a circle of suitable radius to provide a convex surface around which the sheets may pass without undue bending and the rollers at the part 4 of the conveyer are arranged around a similar arc to provide a concave surface. Preferably, as in the form illustrated, the convex and concave portions constitute a major part of the sheet path from one level to the other. The sheet path as a whole takes the cross-sectional form of an ogee curve, wherein there may or may not be a straight portion between the convex and concave portions. Some, and preferably all, of the rollers are connected together by gearing 8 in such a manner that, when the conveyer is in operation, the rollers turn in the same direction and at the same speed to convey the sheets. A series of idler rollers or wheels 9 which may have resilient treads, are provided for the purpose of pressing the sheets 10 as they travel down the conveyer from the pile 11 into contact with the conveying rollers 6 under, for example, spring pressure in such manner that the sheets being conveyed are nipped between the idler rollers or wheels and the conveying rollers, and are constrained to follow the path of the conveying surface. The object of this arrangement is to insure that the sheets are maintained at a constant spacing relative to one another even over the portion of the conveyer of greater slope. The remainder of the bottom end of the conveyer is constituted by tapes 12 traveling over a layboard 13 in the usual manner.

A conveyer as described above may be used, for example, in combination with a sheet separator of the kind described in my Patent No. 2,108,702 operating at or near the rear edge 14 of the pile.

Having thus described my invention, I claim:

1. In a sheet feeding machine, a conveyer for taking sheets from a high pile and conveying them to a feed board at a substantially lower level, said conveyer comprising sheet supporting and conveying elements presenting a sheet path substantially in the form of an ogee curve, one end of said curve being convex and being substantially tangent to the upper surface of the pile and the other end of the curve being concave and being substantially tangent to the feed board, the intermediate portion of the curve being approximately vertical, and means for holding the

sheets against said supporting and conveying elements.

2. In a sheet feeding machine, a conveyor for taking sheets from a high pile and conveying them to a feed board at a substantially lower level, said conveyor comprising sheet supporting and conveying elements arranged exclusively on one side of the sheet path, said elements presenting a sheet path substantially in the form of an ogee curve, one end of the curve being convex and being substantially tangent to the upper surface of the pile and the other end of the curve being concave and being substantially tangent to the feed board, the intermediate portion of the curve being approximately vertical, and means for holding the sheets against said supporting and conveying elements.

3. In a sheet feeding machine, a conveyor for taking sheets from a high pile and conveying them to a feed board at a substantially lower level, said conveyor comprising a series of parallel driven rollers arranged exclusively on one side of a sheet path of ogee form, one end of the curve being convex and being substantially tangent to the upper surface of the pile and the other end of the curve being concave and being substantially tangent to the feed board, the intermediate portion of the curve being approxi-

mately vertical, and means for holding the sheets in tractive relation with certain of said rollers.

4. In a sheet feeding machine, a conveyor for taking sheets from a pile at a relatively high level and carrying them down to a feed board at a lower level, said conveyor comprising sheet supporting and conveying elements arranged to present a sheet path extending from said pile level to said lower level and including an upper convex curve and a lower concave curve, said curves constituting a major portion of said path with an intermediate minor portion extending approximately vertical, and means for holding the sheets against said supporting and conveying elements.

5. In a machine for stream feeding sheets, a feed board, a conveyor for moving the stream fed sheets from a relatively high level down to the level of said feed board through a path comprising convex and concave curves, a series of parallel driven rollers arranged beneath said path, said rollers being spaced closely at each of said curves for the support and guidance of the sheets, the intermediate portion of the sheet path being approximately vertical, and bearing rollers on the opposite side of the path for pressing the stream of sheets against said driven rollers.

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