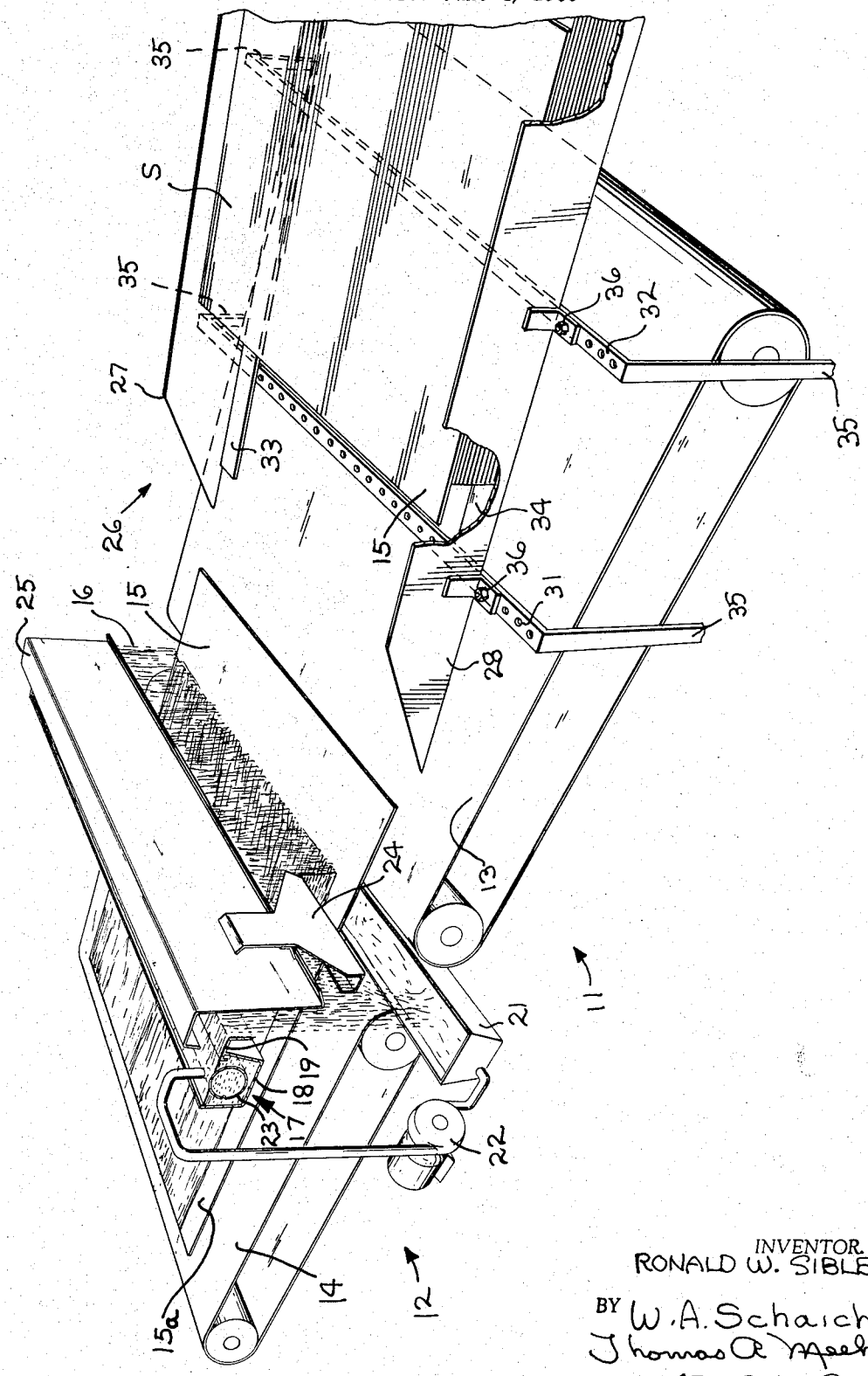
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CURTAIN COATING APPARATUS

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CURTAIN COATING APPARATUS

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ABSTRACT OF THE DISCLOSURE

Apparatus for aligning sheets of fibreboard prior to their acceptance by a device that deposits a curtain coating thereon. A fibreboard sheet guide comprising vertically aligned side members and sheet support members both disposed at an angle to aid in the dispensing of sheets therefrom.

This invention relates to an improvement in apparatus of the type for applying a liquid coating to a planar object by means of a thin free-falling vertical curtain of coating material through which the planar object is passed. More particularly, the invention relates to apparatus for applying a liquid coating to a selected portion of the upper surface of a substantially horizontal sheet of fibreboard by means of curtain coating equipment of otherwise conventional construction. Specifically, the invention relates to curtain coating apparatus of otherwise conventional construction having receiver means positioned beneath the origin of the free-falling curtain of coating material and above the path of travel of the sheet of fibreboard for intercepting a portion of the free-falling curtain and for diverting the intercepted portion away from the path of travel of the sheet of fibreboard and means for effecting accurate lateral positioning of the sheet of fibreboard with respect to such receiver means.

In the coating of planar fibreboard objects such as sheets, carton blanks and the like, with coatings such as wax-plastic blends ("hot-melt" coatings) for moisture resistance, it is frequently desirable to leave an area of the object, and particularly an edge area thereof, free from coating to allow for the subsequent application of adhesives, printing, decorating material, and the like. Such selective coating has heretofore not been satisfactorily attainable by any of the popular curtain coating techniques which otherwise are quite economical and otherwise well-suited for the application of such coatings to fibreboard objects.

In accordance with a prior invention of Leonard J. Masulis, with which I am familiar, which is the subject of U.S. patent application Ser. No. 457,265, filed May 20, 1965, and assigned to the assignee of this present application, it has been proposed that an area of a sheet of fibreboard moving along a horizontal path of travel through the curtain of coating material in a curtain coating machine can be left uncoated by providing receiver means located above the path of travel of the sheet of fibreboard for intercepting a portion of the free-falling curtain and for diverting the intercepted portion away from the path of travel to prevent the intercepted portion from contacting the planar object. In accordance with the present practice of such a curtain coating technique, however, it is necessary to very accurately laterally position the object to be coated on the conveyor means of the curtain coater with respect to the receiver means. Otherwise, the area of the fibreboard object that remains uncoated will be out of register with the area that should have been left uncoated. For example, when it is desired to leave an edge area of a fibreboard blank left uncoated for the subsequent application of adhesives, an error in laterally positioning the fibreboard blank on the curtain coater conveyor means as the blank passes through the falling curtain will lead to an uncoated area that is excessively wide or excessively narrow or, in an extreme case, there will be no uncoated area. Accordingly, it is an object of the present invention to provide apparatus for curtain coating a selected area of a planar object and having means for accurately positioning the planar object as it passes through the curtain coater so that the area left uncoated can be accurately controlled.

For a further understanding of the present invention, attention is directed to the following portion of the specification, the drawing, and the appended claims.

In the drawing:

FIG. 1 is a perspective view of apparatus in accordance with the present invention omitting, however, such supporting structure, drive equipment, and the like not necessary for an understanding of the invention.

A curtain coating machine used in the practice of the present invention is customarily provided with conveyor means comprising a pair of endless belt conveyors **11** and **12** having horizontally aligned and horizontally oriented upper conveying reaches **13** and **14**, respectively. Conveyors **11** and **12** are longitudinally aligned and are spaced apart to define a coating region therebetween. The spacing between conveyors **11** and **12** is sufficiently small that planar objects **15** horizontally situated on conveyor flight **13**, such as carton blanks, will be able to extend across to conveyor flight **14** for transfer thereto.

A thin free-falling curtain of liquid material **16** is formed laterally of conveyors **11** and **12** in the region therebetween by means comprising a curtain forming head **17** which comprises a pan **18** filled with liquid **16** and a carefully constructed overflow weir **19** for passage of liquid **16** therefrom. Any of coating material **16** falling beyond the lateral extent of sheets **15** is caught in trough **21** extending laterally of conveyors **11** and **12** at an elevation lower than the elevation of conveyor reaches **13** and **14**. Coating material caught in trough **21** may be returned to curtain forming head **17** by motor-driven pump **22** and is distributed within pan **18** by means of ported tube **23**. The present invention has been found to have particular utility in the coating of corrugated fibreboard box blanks with a "hot-melt" coating (a blend of plastic and wax) to retard the penetration of moisture or liquid water into the fibres of the blanks with its associated detrimental effects, and, in such cases, there is provided heating means (not shown) to heat the coating material to a temperature within a relatively narrow predetermined range. Curtain coating machines as thus far described are available from the Gasway Corporation, Chicago, Ill. It is also contemplated that the invention hereinafter described can be used to advantage in conjunction with other types of curtain coating machines, such as Steinemann curtain coaters. In the curtain coating of box blanks with a hot-melt coating, it is frequently desirable to leave an edge area of the blank, e.g., area **15***a* of sheet **15**, uncoated in order to allow for the subsequent application of a conventional adhesive to permit the erection of a carton with a relatively inexpensive glued joint from the blank. In accordance with the aforementioned invention of Leonard J. Masulis, edge area **15***a* of sheet **15** extending parallel to the direction of movement or path of travel of sheet **15** through the curtain of material **16** may be left uncoated by providing receiver means to catch or intercept a portion of the free-falling curtain that would otherwise fall on the area to be left uncoated and to divert the intercepted portion away from sheet **15**, for example, by diverting it to trough **21**. Thus, edge area **15***a* of sheet **15** is left uncoated by providing a receiver member **24** disposed above the path of travel of sheet **15**, such as a channel-shaped member, in vertical alignment with curtain forming head **17** for catching the portion of the curtain material that would otherwise fall on the

area 15*a* of sheet 15. Channel-shaped member 24 is frictionally attached to a head cover member 25 that is conventionally provided over curtain head 17 or otherwise retained in place as desired and is provided with a closed end disposed above the path of travel of sheet 15 and an open end disposed above trough 21 exteriorly of the edge of sheet 15.

In order to obtain maximum advantage of the means heretofore described for coating a selected area of fibreboard sheet 15, it is necessary to provide means to laterally position fibreboard sheets on conveyor reaches 13 and 14 with respect to receiver member 24 with precision. In accordance with the present invention, therefore, there is provided such means, indicated generally at 26, comprising side wall members 27 and 28 disposed above conveyor flight 13 of conveyor 11. Members 27 and 28 are spaced apart from one another a distance slightly greater than the width of fibreboard sheets 15 and have their horizontal longitudinal axes extending parallel to the path of travel of sheets 15 through the curtain of material 16. Means 26 further comprises means extending transversely of members 27 and 28, shown as comprising crossbars 31 and 32 to which members 27 and 28 are attached and edge support plates 33 and 34 attached to members 27 and 28, respectively, and extending therewith. Disposed above edge support plates 33 and 34 and crossbars 31 and 32 and supported thereon is a stack S of fibreboard sheets 15 to be processed in succession through the curtain of material 16. Sheets 15 may be fed individually from stack S to conveyor flight 13 by hand from the top of stack S. In such a case, it is desirable to locate rearward crossbar 32 at a slightly higher elevation than forward crossbar so as to give means 26 an inclination from the horizon downwardly to conveyor flight 13.

Crossbars 31 and 32 are attached to vertical members 35 which in turn are secured to the framework (not shown) of the curtain coater that is customarily provided by the machine manufacturer. If desired, the attachment of members 35 to such framework may be vertically adjustable to control the elevation and/or inclination of means 26. Likewise, the attachment of one or both of members 27 and 28 to crossbars 31 and 32 is laterally adjustable, as by the use of bolts 36 for connection, to allow for adjustment of the spacing therebetween, as to accommodate stacks S of sheets 15 of differing widths.

It is believed that the best mode known to me to carry out this invention has been described above in terms sufficiently full, clear, concise and exact as to enable any person skilled in the art to make and use the same. It is

to be understood, however, that it is within my contemplation that certain modifications of the above-described mode of practicing the invention can be made by a skilled artisan without departing from the scope of the invention and it is, therefore, desired to limit the invention only in accordance with the appended claims.

I claim:

1. In curtain coating apparatus for selectively coating a portion of a planar object with a liquid coating material comprising conveyor means for conveying planar objects in succession along a substantially horizontal path of travel from a first location to a second location, curtain forming means above the path of travel between the first and second locations and extending generally laterally across the path of travel for establishing a thin vertically falling curtain of said liquid material, and receiver means vertically aligned with the curtain forming means at an elevation between the curtain forming means and the path of travel for intercepting a portion of the free-falling curtain and for diverting the intercepted portion away from the path of travel to prevent the intercepted portion from contacting the planar object, the improvement comprising means for effecting accurate lateral positioning of the planar objects with respect to the receiver means, said means comprising first and second upright side wall members disposed above the path of travel and proximate to the first location, said first and second side wall members being spaced apart from one another a distance sufficient to closely contain the planar objects and having their horizontal longitudinal axes extending parallel to the path of travel, said means further comprising support means under the planar objects for supporting a stack of planar objects between the side wall members at a location rearward thereof and for guiding an individual planar object at a forward location therebetween as it is being transferred along the path of travel to the conveyor means.

2. Apparatus according to claim 1 and further comprising means for adjusting the spacing between the first and second side wall members.

References Cited

UNITED STATES PATENTS

1,112,811	10/1914	Labombarde	271—35
1,932,506	10/1933	Brackett et al.	271—35
2,111,761	3/1938	Eckert	118—301 X
3,074,374	1/1963	Burkle	118—324

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