Dec. 26, 1967 J. PROULX 3,360,429

SUCTION BOX COVER

Filed Dec. 10, 1964

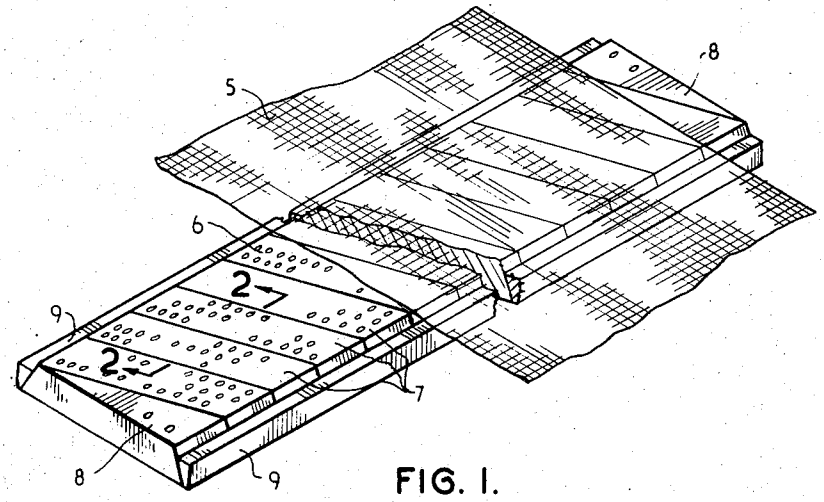


FIG. 1.

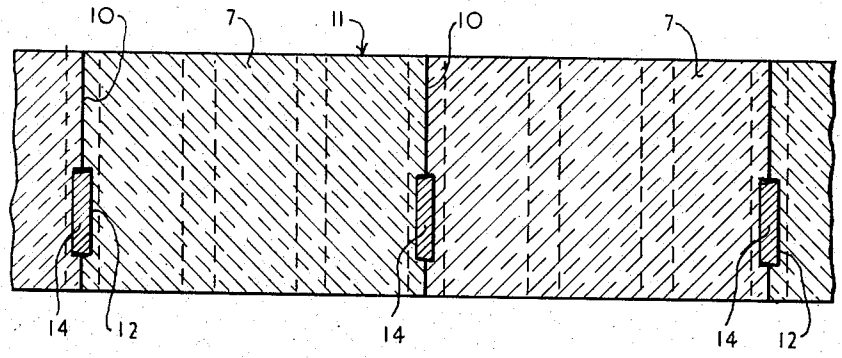


FIG. 2.

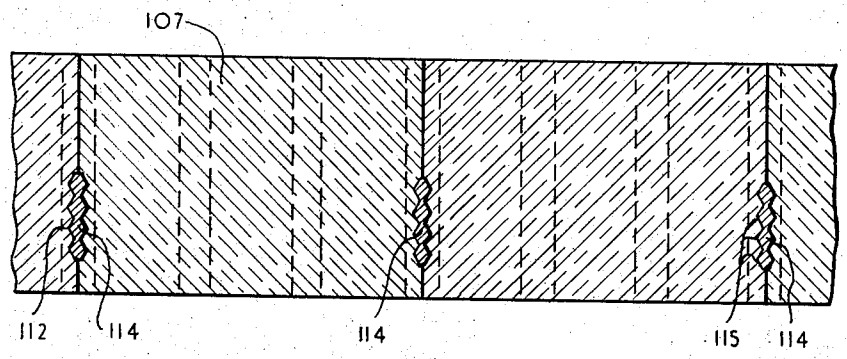


FIG. 3.

INVENTOR
JEAN PROULX
by Irwin Haskett
ATTORNEY

United States Patent Office 3,360,429
Patented Dec. 26, 1967

3,360,429

SUCTION BOX COVER

Jean Proulx, 35 Gamelin Blvd., Hull, Quebec, Canada

Filed Dec. 10, 1964, Ser. No. 417,343
4 Claims. (Cl. 162—363)

ABSTRACT OF THE DISCLOSURE

A suction box cover formed of a plurality of juxtaposed moulded blocks having shallow complementary grooves running the full length of their confronting sides that together provide a cooperative passageway and accommodate therein a thin, vertically disposed, elongated metal reinforcing spline that extends for the length of the blocks to prevent such blocks from buckling or camel backing and so preserve the top surfaces of the cover-forming blocks in coplanar relation.

This invention relates to improvements in a suction box cover for a papermaking machine and appertains especially to a so-called sectionalized cover, i.e., one composed of a plurality of juxtaposed blocks assembled in a row extending across the width of the machine with the respective blocks generally running in, or at an angle to, the line of travel of the forming wire.

My pioneer work in sectionalized covers extending over more than thirty years is exemplified in my early Patents 1,977,352; 2,312,978; and 2,346,785 in which end-of-grain wood blocks were employed. More recently I have developed blocks composed of moulding synthetics that are attractive because of their wear-resisting and low coefficient of friction qualities. (These are disclosed in copending applications "Method of Making Interlocking Suction Box Cover Blocks," Ser. No. 223,988, and "Suction Box Covers," Ser. No. 223,989, both filed Sept. 17, 1962.)

Though a suction box cover composed basically of a synthetic such as a urethane polymer would meet many of the requirements of the industry, it has not been feasible to produce a good moulded cover in one large sheet but I have found it most satisfactory to continue to form the cover of a plurality of relatively small blocks not dissimilar in size and shape to the end-of-grain wood blocks that I have been supplying to the paper mills for many years.

By moulding the blocks in small sized units I have been able to produce individual and identical cover-forming blocks of consistent uniformity throughout their entire depth thereby providing a hard, dense suction box cover of excellent wearing quality, low coefficient of friction and longer life than was heretofore available. Such moulded blocks are precision machined and drilled and being substantially impervious to the heat, water and paper stock ingredients encountered, an almost air-tight joint is obtained between contiguous blocks.

In some cases a slight, almost imperceptible swelling of the blocks may occur in the order of ±1% and this, especially in wider section boxes, could cause a minimal bulging or humping of one block relative to its neighbor. To resist any such vertical bulging that would destroy the perfect smoothness and symmetry of the wire-bearing surface, I now employ a thin vertical steel strip spline on each side of each block (excepting those on opposite ends) running the full length thereof.

Accordingly, it is an object of this invention to provide a sectionalized suction box cover having a reinforcing spline between adjoining blocks to give added strength to the cover blocks along their entire bridging length and to prevent any relative bulging thereof that would disalign their upper sides.

A further object of the invention is to provide a sectionalized suction box cover composed of a plurality of matching moulded blocks with interengaging splines of substantially greater strength than the material of the blocks to resist vertical stresses and to direct any swelling of the block into horizontal longitudinal expansion rather than vertical.

A further object of the invention is to provide a sectionalized suction box cover composed of a plurality of matching moulded blocks with interengaging splines of elongated very narrow strips of steel with the major dimension disposed vertically thereby avoiding any intrusion on the suction hole pattern.

A further object of the invention is to provide a sectionalized suction box cover in which adjoining blocks of moulded polyurethane cooperatively house a rigidifying, stress-resisting metal spline in confronting complementary grooves, the spline being frictionally held in one block and permitted a sliding fit in the other.

A still further object of the invention is to provide a spline-reinforced suction box cover of the nature and for the purpose described that is characterized by structural simplicity, ease of handling and assembly and high operational efficiency.

To the accomplishment of these and related objects as shall become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts as shall be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claims hereunto appended.

The invention will be best understood and can be more clearly described when reference is had to the drawings forming a part of this disclosure wherein like characters indicate like parts throughout the several views.

In the drawings:

FIGURE 1 is a perspective view of an assembled suction box cover, with a forming wire superimposed, parts thereof being broken away;

FIGURE 2 is an enlarged vertical section as taken on line 2—2 of FIGURE 1, showing the positioning of the splines between adjoining blocks; and

FIGURE 3 is a similar sectional view embodying a modified form of spline.

Referring particularly to these drawings, a portion of a Fourdrinier wire **5** is shown superimposing the suction box cover **6** over which it is designed to travel. The cover is composed of a plurality of individual juxtaposed blocks **7** arranged in a row that runs transversely of the paper making machine and line of travel of the forming wire. The blocks bridge the open top of the suction box and preferably lie at an angle to or substantially diagonally of the line of travel of the forming wire, as clearly seen in FIGURE 1, with a suitable triangular shaped filler block **8** at each end to square off the cover. Appropriate side rails **9**, with confronting tapered walls to correspond with the inclined ends of the elongated, suction box-bridging, individual blocks, serve, in conjunction with the end filler blocks **8** to hold the assembled cover **6** on a suction box.

The blocks **7** with any desired suction hole pattern are formed of suitable material such as a moulded polyurethane which when properly treated and with certain additives provides a hard dense block, of uniform consistency throughout its entire depth with excellent wearing qualities and low coefficient of friction, that can be precision machined to exact size and shape desired. Such blocks are described in detail in one or more of the hereinbefore mentioned patents and/or pending applications.

While such individual blocks are relatively strong and quite able to bear normal load stresses and furthermore since they are substantially impervious to water and the usual paper stock acids so that little soaking, swelling or

bulging occurs under the conditions usually encountered, it is desirable that the upper surface of the cover over which the forming wire travels be maintained at all times in a smooth unbroken condition with the top sides of the several component blocks in as perfect coplanar relation as possible, throughout their long serviceable life.

To this end I have found a preferred means of reinforcing the sectionalized or block-forming cover to effectively resist vertical stresses such as load and swelling that might induce bulging or camel backing. The individual blocks **7** are each formed with parallel side walls **10** here shown as being disposed vertically and at right angles to the horizontal top **11**. In each side wall **10**, a wide shallow groove **12** is provided having a wide open mouth extending vertically but cutting into the side wall for only a very little depth, thereby avoiding any unwanted intrusion on the suction hole pattern. These grooves **12** are at the same level in each of the blocks **7** in a cover and so in an assembled cover the grooves are complementary in adjoining blocks, confronting one another and together forming a cooperative passageway extending the length of the blocks as they bridge the suction box. In the complementary pair of grooves **12** between each pair of blocks an elongated reinforcing metal spline **14** of stainless steel or the like is cooperatively housed with substantially half its thickness extending into each block and running for the entire length of the blocks.

In the enlarged cross-sectional view in FIGURE 2, the spline **14** appears as a thin, wide ribbon of substantially rectangular cross section, and this form of spline, with the hard dense block I use, provides a satisfactory degree of reinforcement, due in part to the true and tight contact of the adjoining precision machined blocks arranged in a row and confined between the end filler blocks **8** and the retaining side rails **9**.

To facilitate the assembly of the suction box cover, it has been found useful to bevel the top and/or bottom edges of the metal strip so that the same may be proportioned to have a tight frictional fit or holding engagement with the groove in one block and a close tolerance sliding fit in the complementary groove of the adjoining or confronting block, so that prior to assembling the cover, the spline is carried by the block in which it has the holding engagement. The grooves are preferably identical and positioned in the lower one-half of the blocks.

In FIGURE 3, the blocks **107** are the same as those described except that they have a modified form of groove **112** that has a number of angular troughs running the length thereof so that each complementary pair provide a housing for a metal spline **114** that in cross section has the form of a ribbon with a number of angular or bevelled ribs **115** on each side thereof to provide an increased bearing area in contact with each of the adjoining blocks to better resist vertical stresses and direct any swelling of the blocks into horizontal longitudinal expansion.

Though the blocks are described as being of moulded polyurethane and the splines as thin metal ribbons of stainless steel disposed vertically or on edge, the specific materials may be varied where found desirable providing the essential and relative characteristics are retained.

From the foregoing description taken in connection with the accompanying drawings, it will be manifest that a suction box cover is provided that will fulfill all the necessary requirements of such a device, but as many changes could be made in the above description and many apparently widely different embodiments of the invention may be constructed within the scope of the appended claims, without departing from the spirit or scope thereof, it is intended that all matters contained in the said accompanying specification and drawings shall be interpreted as illustrative and not in a limitative or restrictive sense.

What is claimed as new is:

1. A suction box cover comprising a row of juxtaposed moulded blocks with complementary shallow grooves extending the length of the blocks in confronting faces of adjoining blocks that together form a cooperative passageway and an elongated metal reinforcing spline disposed between adjoining blocks and cooperatively housed in said complementary grooves.

2. A sectionalized suction box cover for a paper making machine comprising a plurality of precision machined moulded blocks arranged in a row extending transversely of the machine, said blocks having complementary grooves in their confronting faces and elongated narrow splines running the length of said blocks disposed between adjoining blocks and cooperatively housed in the said complementary grooves in the confronting faces of said blocks, said splines having their major cross-sectional dimension lying vertically to resist vertical stresses such as load and upward bulging.

3. The suction box cover according to claim **2** wherein the grooves in the precision machined blocks are wide and shallow, cutting very little depth into the side wall of the block but with an open mouth extending vertically in the side wall face for a substantial distance, thereby avoiding any intrusion on the suction hole pattern.

4. The suction box cover according to claim **2** wherein the elongated narrow splines are slightly higher along one side to give frictional holding engagement with the groove in the block engaged by such higher side while having sliding fit in the complementary groove of the confronting block.

References Cited

UNITED STATES PATENTS

2,408,176 9/1946 Proulx ---------- 162—374

DONALL H. SYLVESTER, *Primary Examiner.*

A. C. HODGSON, *Assistant Examiner.*