Dec. 27, 1955 F. JAVID 2,728,273

PAPER MACHINERY

Filed Dec. 29, 1951 3 Sheets-Sheet 1

Fig-1

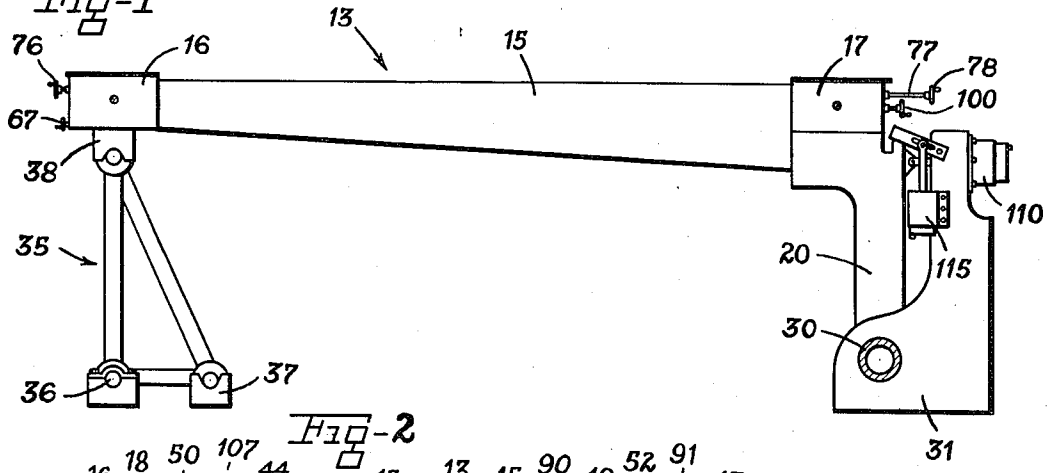


Fig-2

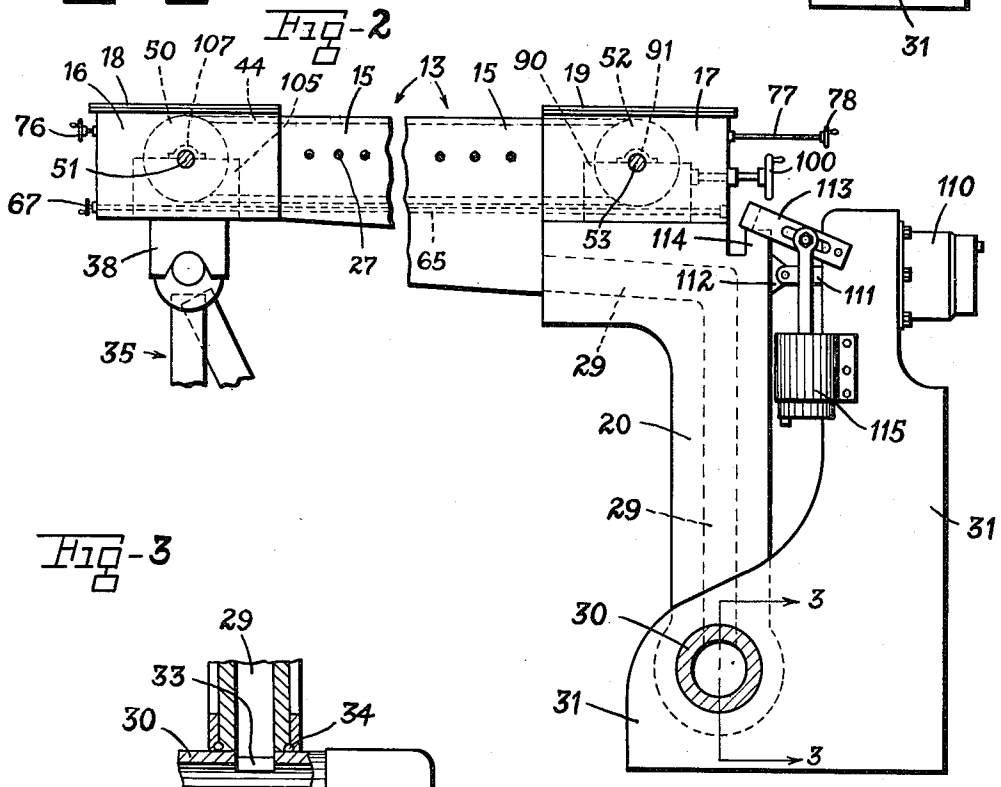


Fig-3

INVENTOR
FARHANG JAVID

BY Marechal Biebel French & Bugg
ATTORNEYS

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Fig-4

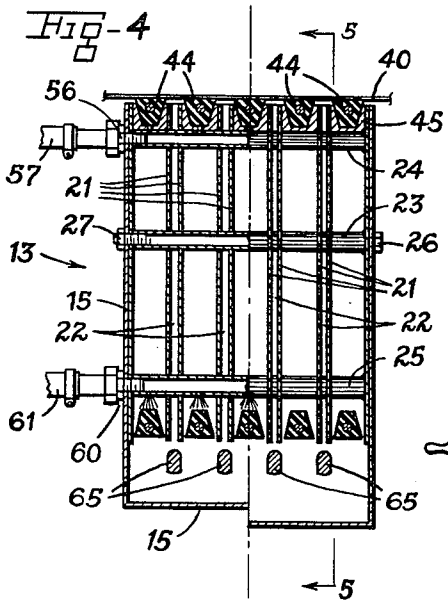


Fig-5

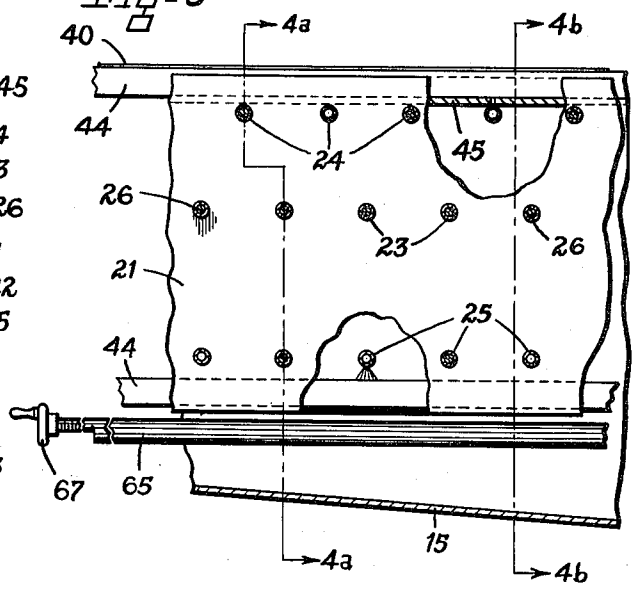


Fig-6

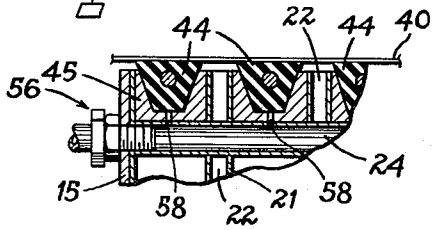


Fig-7

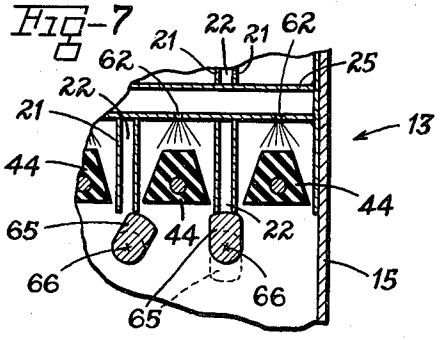


Fig-8

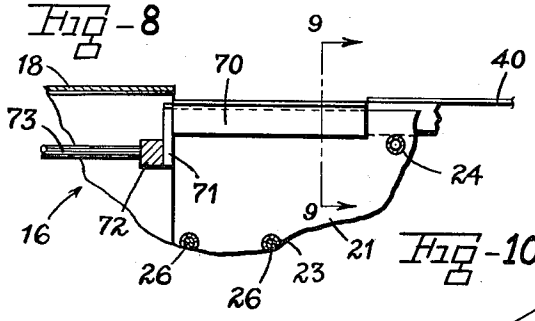


Fig-10

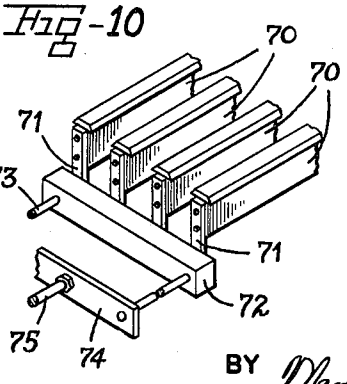
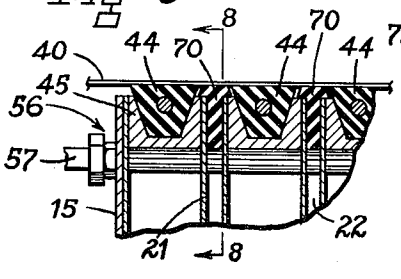


Fig-9



INVENTOR
FARHANG JAVID
BY Marechal Bicbel French & Lugg
ATTORNEYS

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Fig-11

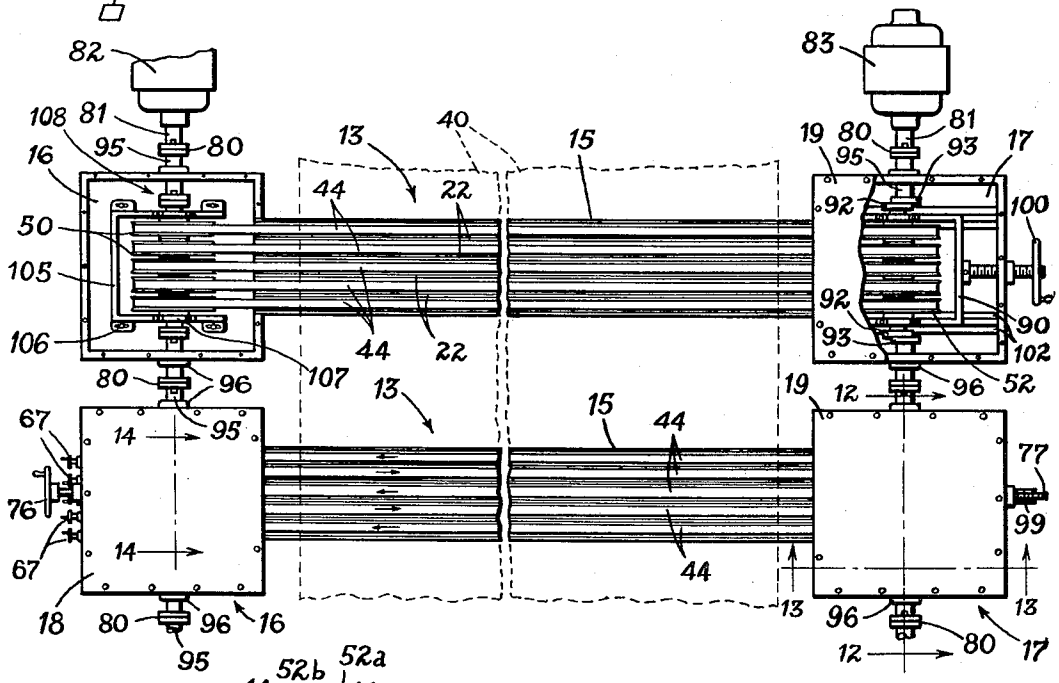


Fig-12

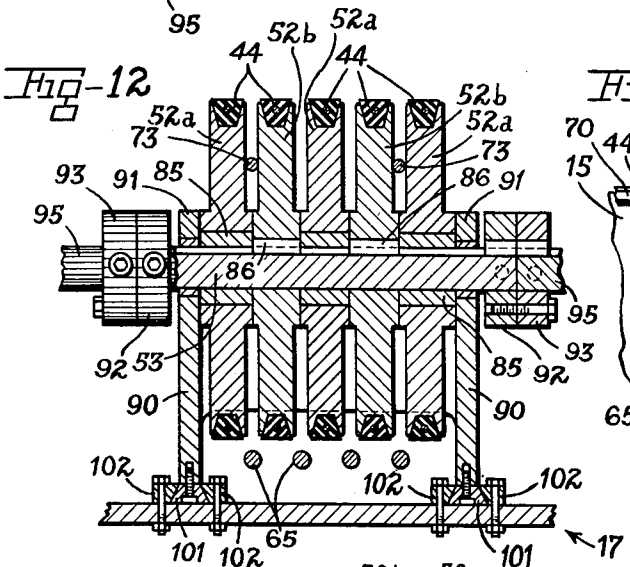


Fig-13

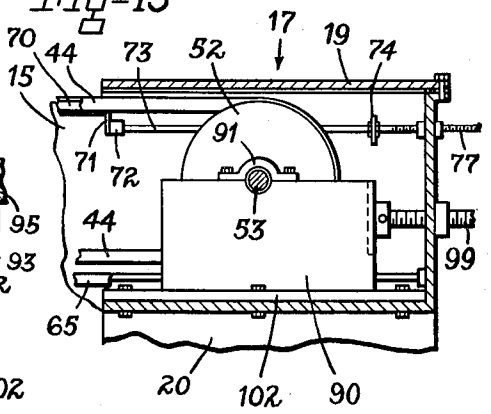
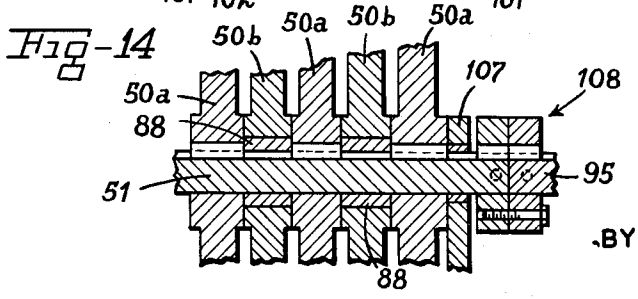


Fig-14



INVENTOR
FARHANG JAVID
BY Marechal Biebel French & Bugg
ATTORNEYS

United States Patent Office 2,728,273 Patented Dec. 27, 1955

2,728,273

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Farhang Javid, Middletown, Ohio, assignor to The Black-Clawson Company, Hamilton, Ohio, a corporation of Ohio

Application December 29, 1951, Serial No. 264,090

10 Claims. (Cl. 92—51)

This invention relates to paper machinery and more particularly to suction boxes for use in a paper machine.

The invention has as a primary object the provision of a suction box for use with a Fourdrinier wire or other web in a paper machine which is so constructed and arranged as to reduce wear on both the web and the surface areas of the box engaged by the web in operation while at the same time establishing effectively uniform suction conditions across the entire width of the web.

Another object of the invention is to provide such a suction box wherein the surface portions engaged by the web are formed by continuous belt members arranged for continuous travel transversely of the web to present a constantly changing surface thereto and also to give a total area for engagement with the web which is materially greater than the area actually in contact with the web at any single moment, thus correspondingly distributing the wear on the box, and a special object is to provide such a suction box construction wherein any given pair of points on the web and the box surface respectively come in contact with each other only at rare and widely spaced intervals.

An additional object is to provide a suction box as outlined above in which the surface in engagement with the web is composed of multiple continuous traveling members arranged transversely of the web in spaced relation lengthwise of the direction of web travel to define multiple spaced slots therebetween through which suction may be applied equally across the entire width of the web and in which adjacent traveling members or groups of traveling members are caused to travel in opposite directions transversely of the web to present a continuously changing surface thereto without affecting the proper course of web travel while at the same time reducing wear on both the web and the traveling members.

Among other objects of the invention are to provide a suction box having multiple spaced slots extending across the width of the web which incorporates a selectively operable control for regulating the degree of suction through each slot in accordance with the desired distribution of suction lengthwise of the web as it crosses the suction box, and also to provide such a suction box having adjustable controls for regulating the effective length of the suction slots in accordance with the width of the sheet on the web.

It is also an object of the invention to provide a suction box having a traveling surface for engagement with the web in which the portion of the surface out of engagement with the web is continuously washed to remove solid matter deposited thereon during its previous engagement with the web and thus to maintain the working surface of the box clean for minimum friction with respect to the web.

A further object is to provide a suction box as outlined above which is readily adapted for mounting in cantilever fashion such that it may be tilted at one side of the paper machine to raise the end thereof at the opposite side of the machine for convenient changing of the web without otherwise requiring disconnection or removal of parts.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

Fig. 1 is an elevational view of a suction box constructed in accordance with the invention for incorporation in a Fourdrinier paper machine, with the view being taken in a vertical plane transverse to the direction of wire travel;

Fig. 2 is an enlarged fragmentary view of the suction box of Fig. 1;

Fig. 3 is a fragmentary section on the line **3—3** of Fig. 2 showing the connection of the suction box to the suction line;

Fig. 4 is an enlarged transverse section with the left hand portion thereof taken approximately on the line *4a—4a* of Fig. 5 and the right hand portion taken approximately on the line *4b—4b* of Fig. 5;

Fig. 5 is a section on the line **5—5** of Fig. 4, with parts broken away to illustrate details of internal construction;

Figs. 6 and 7 are enlarged fragments of upper and lower portions of Fig. 4 respectively;

Fig. 8 is an enlarged fragmentary section taken on the line **8—8** of Fig. 9 and showing one of the deckle units for adjusting the effective width of the suction area of the suction box;

Fig. 9 is an enlarged fragmentary section on the line **9—9** of Fig. 8;

Fig. 10 is a fragmentary perspective view of the deckle unit of Figs. 8 and 9;

Fig. 11 is a fragmentary plan view showing a plurality of the suction boxes of Fig. 1 incorporated in a Fourdrinier paper machine;

Fig. 12 is an enlarged fragmentary section on the lines **12—12** of Figs. 11 and 13;

Fig. 13 is a section on the line **13—13** of Fig. 11 and on a larger scale; and

Fig. 14 is a fragmentary section on the line **14—14** of Fig. 11.

Referring to the drawings, which illustrate a preferred embodiment of the invention, the suction box is an enclosure **13** having an open upper side portion across which the wire or other wires travel. A plurality of continuous belts extend across this open portion of the box transversely of the direction of travel of the web and in spaced relation to define slots therebetween communicating with the interior of the box, and the upper surfaces of the belts cooperate to form a perforate or otherwise interrupted surface which supports the web as it travels across the box and through which the suction within the box is effective on the web. In operation, these belts are continuously driven transversely of the web to present a continuously changing supporting surface or cover in engagement with the web, and this also has the advantage of preventing continued travel of the web across the same parts of the supporting surface and correspondingly distributes wear over a total surface area more than twice the width of the web.

The suction box **13** is shown as including a main box-like enclosure **15** open along its upper side and secured at its ends to end sections **16** and **17** having removable top plates **18** and **19** respectively, and the back end section **17** is mounted on a post **20** which forms the main supporting part of the suction box. Within box portion **15** are a plurality of cooperating pairs of vertical walls **21** arranged in spaced parallel relation to form a corresponding plurality of narrow slots **22** which extend the full length of the box between the end sections **16** and **17**. The walls **21** are maintained in braced relation by a plurality of reinforcing tubes shown as arranged in

rows 23, 24 and 25, and these tubes extend through the walls 21 and are welded thereto and cooperate therewith to form a composite core which is shown as supported within box part 15 by elongated bolts 26 and nuts 27 providing for removal and replacement of the core as a unit.

The bottom wall of the box part 15 is shown as inclined downwardly towards the end shaft 20 for gravity drainage of water to the passage 29 in post 20 which is adapted to be connected to a pump or other source of suction. For example, the post 20 may be mounted as shown on a pipe 30 supported in a stand 31, and this pipe 30 is connected at 32 (Fig. 3) with the suction pump (not shown) and is provided with a slot 33 adapted to register with the passage 29 in the post 20, with this connection being sealed by means of O-rings 34 as shown in Fig. 3. Thus suction from the pump is applied through pipe 30 and the passage 29 to the interior of the enclosure and to the lower ends of the slots 22 defined by the walls 21. The front end of the box is shown as supported by a triangular stand 35 pivoted at the front in a fixed bearing 36 and with its rear leg resting in a support 37, the box having a pad 38 on the bottom of its front end section 16 adapted to rest on the upper end of the frame 35.

The suction box 13 is shown in use with a Fourdrinier wire 40, and the V-belts 44 which form the supporting surface for the wire in its travel across the box are each supported in a guide trough member 45 welded or otherwise secured between an opposite pair of walls 21 to form a track for its associated belt, these parts being so proportioned that the belts extend upwardly above the walls 21 in spaced relation longitudinally of the wire to leave openings therebetween of approximately the same area as the upper ends of slots 22. Belts 44 are supported by sheaves 50 on a shaft 51 at the front end of the box and on sheaves 52 on a shaft 53 at the back end of the box providing for continuous driving of the belts to present continuously changing advancing flight portions of the belts for engagement with the wire while the return flight portions of the belts pass through the interior of the box below walls 21.

Lubrication between the belts 44 and trough members 45 is readily provided by connecting one or more of the tubes 24 at 56 to a hose 57 or other outside source of water pressure and by forming ducts 58 (Fig. 6) between each tube 24 and the bottom of each trough member to force a small flow of water into the trough member. With this construction, highly satisfactory results are obtained by constructing the belts 44 of plastic or any other material which offers the advantages of strength and low friction, particularly in the presence of water as a lubricant, one example being the plastic material sold under the trade name Koroseal. Provision is made for continuously washing the return flight portions of the belts to maintain them free of such fiber as may transfer thereto from the wire. Referring to Figs. 4 and 7, one or more of the tubes 25 may be connected at 60 to a hose 61 or other outside source of water and may be formed with discharge openings 62 in the portions thereof between slots 22 to provide showers of water directed downwardly on the return flight of the belts 44.

The arrangement of the slots 22 and belts 44 as shown establishes a plurality of uniform suction areas extending across the full length of the suction box and therefore across the full width of the wire, and provision is made for individually regulating the effective suction through each slot 22 in accordance with the rate at which it is desired to draw water out of the sheet on the wire. Referring particularly to Figs. 5 and 7, a rod 65 of oblong cross-section is pivoted below each slot 22 on an axis 66 and is provided with a hand wheel 67 at the outer end of the box. The rod 65 is so proportioned that it is rotatable between a position totally closing the associated slot 22 (shown at the right in Fig. 7) and a fully open position as shown in Fig. 4, and Fig. 7 also shows one of the rods 65 in an intermediate position allowing only a limited amount of suction to be effective on its associated slot 22.

Deckle units are provided for adjusting the effective length of each slot 22 as required to accommodate the suction box to use with wires of varied widths. Referring especially to Figs. 8–10, a sliding member shown as a deckle 70 is mounted in the front end of each slot 22, and each deckle 70 is shown as T-shaped to provide an upper portion seating on the upper end of the slots 22 and substantially filling the space between adjacent belts 44. All of the deckles 70 at one end of the box are connected by brackets 71 to a bar 72 which is in turn connected through rods 73 and a strap 74 to a control rod 75 threaded through the outer end of the box and provided with a hand wheel 76. Thus rotation of the hand wheel and rod 75 will cause the group of deckles 70 to slide back and forth in the slots 22 and will thus change the effective dimension of the slots 22 transversely of the wire.

The deckle unit may be provided only at one end of the suction box, usually the front end for more convenient access, or it may be duplicated at the other end of the box as indicated in Fig. 2 by the control rod 77 and hand wheel 78. In the latter case, the two units are adjusted so that the distance between their inner ends substantially equals the width of the wire to prevent short circuiting of the suction around the side edges of the wire. If only a single unit is used at one end of the box, the wire will be guided into cross relation with the top plate 19 at the back end of the box, and the deckle unit will be adjusted so that its inner ends match the front edge of the wire. In either case, there will preferably be a space of at least two or more inches at the front end of the box between the side edge of the wire and the top plate 18 to provide corresponding portions of the belts 44 free of the wire for ready visual inspection while the machine is running.

As noted, during operation of the machine the belts are continuously driven transversely of the wire, and their speed is preferably much slower than that of the wire in order to minimize the tendency for the moving belts in contact with the wire to cause undesired lateral movement of the wire out of its preferred straight line path of travel. Such tendency to lateral movement can be compensated for on the machine by means of a guide roll as shown for example in Staege Patent 2,484,473 issued October 11, 1949, to the assignee of this application. However, in accordance with the present invention preferred results are obtained by driving alternate belts or alternate groups of belts in opposite directions so that they effectively counteract any tendency of each other to cause such lateral movement of the wire. For example, Fig. 11 shows a plurality of suction boxes 13 constructed as described and each having the shafts therein connected by couplings 80 with each other and with the drive shafts 81 of a pair of motors 82 and 83 located on opposite sides of the wire and of the gearhead type or otherwise equipped with speed reduction means for the desired slow movement of the belts, and Figs. 12 and 14 show drive arrangements for the suction boxes such that each belt 44 is driven in the opposite direction from the adjacent belt or belts on either side thereof.

Referring to Fig. 12, which shows a total of five belts in the single box, the central belt and the two outermost belts are supported on sheaves 52*a* mounted by means of bushings 85 for free rotation on the shaft 53, but the two sheaves 52*b* supporting the other two belts are keyed at 86 to the shaft 53. With this arrangement, the two sheaves 52*b* are positively driven by shaft 53, and the converse arrangement is provided within the opposite end of the box. As shown in Fig. 14, the sheaves 50*a* supporting the outermost and the central belts are keyed to the shaft 51 which is driven in the opposite direction

from shaft **53**, while the two sheaves **50***b* supporting the belts running over sheaves **52***b* are mounted for free rotation on shaft **51** by means of sleeves **88**. Thus the belts running on the sheaves **50***a* and **52***a* all travel in one direction while the belts running over the sheaves **50***b* and **52***b* travel in the opposite direction, and this relation of belts is reversed in the adjacent suction box or boxes so that each belt in each series of boxes run in the opposite direction from the belts on either side thereof. It should also be noted that the number of belts in each box may be varied for particular installations, and if desired, all the belts for a given machine may be mounted in a single box as shown in the copending application of Joseph Baxter, Jr., Serial No. 264,088 filed of even date herewith and assigned to the same assignee as this application.

Figs. 11–14 show mountings for the shafts **51** and **53** facilitating removal of the sheaves for replacement of the belts **44**. The shaft **53** is mounted in a generally U-shaped carriage **90** by means of bearings including removable caps ar flanges **91** bolted to the carriage, and shaft **53** is provided at each end with a coupling member **92** keyed or otherwise removably secured thereto and adapted for connection to a complementary member **93** on a connecting shaft **95** extending through the wall of box end section **17** and provided with a suitable pressure seal **96**. Similar coupling units **80** are shown as used to connect a series of shafts **95** together and to the motor drive shaft in Fig. 11, but it is to be understood that this arrangement is intended as a diagrammatic representation of suitable means for coupling this series of shafts in driven relation with a drive shaft, and other detachable shaft and coupling arrangements could be used without departing from the scope of the invention.

The carriage **90** is mounted for movement within the suction box to provide for releasing the tension in belts **44** after couplings **92—93** are released, and a control screw **99** threaded through the end wall of the box is provided at its outer end with a handwheel **100** and is connected at its inner end to the carriage **90** to cause back and forth movement of the carriage as screw **99** rotates. Carriage **90** is shown as mounted in guided relation with the suction box by means of slides **101** on its lower side edges which cooperate with gibs **102** bolted to the bottom wall of the end section **17**. Thus when the couplings **92—93** are released, the carriage can be moved inwardly of the box as indicated in Fig. 11 to release the tension in the belts and after flanges **91** are removed, the shaft and sheaves can be lifted from the carriage to free the belts for removal and replacement. If a sheave requires replacement, this can then be done by removing a coupling member **92** from the shaft.

This removable mounting arrangement for the sheaves may be provided at either or both ends of the box but it is shown only at the back end. A fixed mounting for shaft **51** is shown at the front end of the box comprising a frame **105** bolted at **106** to the bottom wall of end section **17**, the connection **106** being shown as adjustable to provide for accurate alignment of shaft **51** with connection shafts **95**. Otherwise the mounting for shaft **51** is essentially the same as that for shaft **53**, including removable bearing caps **107** and releasable couplings **108** forming the connections to the shafts **95**.

This arrangement of releasable and removable mountings for the sheaves and shafts, together with the removable mounting of the core section of the box, makes it a simple matter both to assemble the box initially and also to replace the belts whenever that is necessary. Thus in assembling the box, the belts can be looped loosely around the core outside the box, and the core then mounted in place as described by means of the bolts or rods **26**, after which the sheaves can be assembled on their shafts and connected with the belts to complete the assembly. Similarly to replace a belt or belts, it is merely necessary to release the two shafts and remove

them and the core section temporarily from the remainder of the box.

The suction box of the invention is also especially advantageous for incorporation in a Fourdrinier paper machine wherein the wire section is provided with a cantilever mounting to facilitate changing of the wire. For example, the post **20** of the suction box may be mounted for pivotal movement on the pipe **30**, and Figs. 1 and 2 show a fluid pressure cylinder **110** mounted on the stand **31** for effecting rocking movement of the suction box, the cylinder **110** having its piston rod **111** connected with a bracket **112** at the back of the post **20**. Thus when pressure is applied to cylinder **110**, the post **20** is pulled so that the entire suction box rocks on pipe **30** to raise the front end thereof away from its supporting frame to permit the whole wire to be rocked and a new wire to be mounted in place from the front of the machine. The suction box may be rotatably held in raised position by means such as the loop shaped latch member **113** pivoted to the upper end of the stand **31** and adapted to slip over the cooperating latch portion **114** on the post **20** of the suction box. Disengagement of each latch **113** is shown as effected by means of a fluid pressure cylinder **115** mounted on the stand **31** and having its piston rod pivoted in a slot **116** in the latch **113**. The cylinder **115** may be double-acting to operate the latch in both directions, or it may be single-acting to disengage the latch, with engagement of the latch being effected by gravity after the suction box has been raised a sufficient distance.

This suction box construction offers multiple important practical advantages in operation from the standpoint of both improved suction conditions and also simplified and improved maintenance. For example, with each suction slot **22** extending completely across the full width of the wire and of equal dimensions across its entire effective opening, the suction conditions through each slot are uniform across the full width of the wire, and this effectively prevents pattern formation in the web such as may result from the use of suction box surfaces having multiple perforations arranged crosswise of the wire. At the same time, with the portions of the supporting surface between the slots formed by the belts **44**, there is greatly reduced tendency to wear of the box surface as contrasted with wood faced boxes, and the continuous belt arrangement offers the further advantage of correspondingly extending the area over which the wear is distributed, since the effective working surface of the box has more than twice the width of the wire and is uniformly active over its entire area in contact with the wire.

Another important practical advantage is the improved and convenient control of the application of suction to the newly formed web as it progresses across a series of these suction boxes. For example, if it is desired to avoid sudden application of suction to the web and instead to increase the suction gradually so that the fibers in the web are not unduly compressed by the first application of suction, the rods **65** can be adjusted progressively in the direction of wire travel so that relatively low suction is effective on the first slot or group of slots encountered by the wire, followed by increasing suction produced by progressively opening the lower ends of the slots **22**. This arrangement allows an effectively infinite variation of the suction pattern in accordance with the particular desired results with a given sheet.

A further important advantage provided by the present invention, particularly from the standpoint of maintenance of the paper machine, is the reduction in wear between the wire and the surfaces of the suction boxes. Thus where with conventional constructions the wire continuously runs across the same surface, the arrangement of belts in the present suction box presents a constantly changing surface to the wire, and the relative

speeds of the belts and the wire may be readily correlated in such manner that the same two points on the wire and a given belt will not come in contact more than once in a period of hours. For example, it will usually be found advantageous to drive the belts at a comparatively very slow speed such, for example, as a speed of one foot per minute or less, since at speeds of this order, the belts will be effectively stationary so far as lateral wear between their surfaces is concerned. However, even a speed as low as one foot per minute will cause the desired constantly changing surface preventing frequent coincidence of the same points on the belts and the wire. Thus as an illustrative example, if the wire is 80 feet long and travels at 1600 feet per minute, and if each belt is 32.65 feet in length, the time required at a belt speed of one foot per minute for a given pair of points on the wire and belt to coincide twice will be 32.65 minutes. It will also be seen that if in the above example the belt speed is reduced, this time interval will be correspondingly increased, and as a further specific example, if the belt speed is ¼ feet per minute, the time required for the two points to coincide twice will be increased to more than two hours.

The suction box construction of the invention incorporating the multiple continuously traveling belts has still another important advantage in that it makes possible continuous inspection of the entire suction surface of the box without interruption of the operation of the machine, since the portions of the belts lying between the side edges of the wire and the top plates **18** and **19**, are all times open to visual inspection. Thus, with the belts traveling at the slow speeds noted above, any worn or otherwise defective spots which may develop can be quickly detected before they can cause damage to the wire or otherwise undesirably affect operations, and such defective belt or belts can be readily replaced as described.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and providing communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, means carried by said enclosure for supporting said belts for movement across said open portion of said enclosure in a direction substantially transverse to the direction of travel of said web, drive means connected with said supporting means for causing continuous movement of said belts in said transverse direction to present a continuously changing surface in engagement with said web, and means cooperating with said drive means to cause substantially one-half of said belts to travel in the opposite direction from the remainder of said belts to prevent said moving belts from causing lateral movement of said web.

2. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and providing communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, means including sheaves mounted at the ends of said enclosure for supporting said belts for movement across said open portion of said enclosure in a direction transverse to the direction of travel of said web, drive means for said sheaves, and driving connections between said drive means and said sheaves arranged to cause alternate sheaves to rotate in opposite directions and thereby to cause alternate said belts to travel in opposite directions preventing said moving belts from causing lateral movement of said web.

3. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and providing communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, means including sheaves mounted at the ends of said enclosure for supporting said belts for movement across said open portion of said enclosure in a direction transverse to the direction of travel of said web, drive means for said sheaves, driving connections between said drive means and said sheaves arranged to cause alternate sheaves to rotate in opposite directions and thereby to cause alternate said belts to travel in opposite directions preventing said moving belts from causing lateral movement of said web, and means cooperating with said drive means and said driving connections to cause said sheaves to rotate at slow speeds causing said belts to move at speeds substantially less than the rate of travel of said web.

4. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and providing communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, means carried by said enclosure for supporting said belts for movement across said open portion of said enclosure in a direction substantially transverse to the direction of travel of said web, drive means connected with said supporting means for causing continuous movement of said belts in said transverse direction to present continuously advancing flight portions of said belts for engagement with said web and return flight portions within said enclosure, means cooperating with said drive means to cause substantially one-half of said belts to travel in the opposite direction from the remainder of said belts to prevent said moving belts from causing lateral movement of said web, and means within said enclosure for continuously washing said return flight portions of said belts to remove fiber therefrom.

5. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and defining slots therebetween for communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, means including separate valves within said enclosure for controlling the effective flow area through each said slot to regulate the suction therethrough, means for individually operating said valves to control the relative suction through said slots, means carried by said enclosure for supporting said belts for movement across said open portion of said enclosure in a path substantially transverse to the direction of travel of said web, and drive means connected with said supporting means for causing continuous movement of substantially one-half of said belts in opposite directions along said transverse path to present

a continuously changing surface in engagement with said web and to prevent said moving belts from causing lateral movement of said web.

6. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and defining slots therebetween for communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, walls arranged in spaced relation within said enclosure to form continuations of said slots, separate valves associated with the inner end of each said slot continuations and including a rod mounted within said enclosure on an eccentric axis providing for opening and closing the inner end of each said slot continuation upon rotation of said rod, separate handles for said valve rods mounted on the outside of said enclosure to provide for individual operation of said valves and resulting control of the relative suction through said slots, means carried by said enclosure for supporting said belts for movement across said open portion of said enclosure in a path substantially transverse to the direction of travel of said web, and drive means connected with said supporting means for causing continuous movement of substantially one-half of said belts in opposite directions along said transverse path to prevent said moving belts from causing lateral movement of said web and to present a continuously changing surface in engagement with said web.

7. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, means including a plurality of continuous belts arranged in spaced relation to form an interrupted surface extending across said open portion of said enclosure for engagement with said web and defining slots therebetween for communication therethrough with the interior of said enclosure for applying suction to said web moving thereacross, a sliding member mounted within one end of each said slot to close said end along the outer edge thereof, means for moving said sliding members within said slots laterally of the direction of travel of said web to vary the effective lengths of said slots in accordance with the widths of said web, means carried by said enclosure for supporting said belts for movement across said open portion of said enclosure in a path substantially transverse to the direction of travel of said web, and drive means connected with said supporting means for causing continuous movement of substantially one-half of said belts in opposite directions along said transverse path to prevent said moving belts from causing lateral movement of said web and to present a continuously changing surface in engagement with said web.

8. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, a plurality of parallel walls arranged within said enclosure in spaced relation substantially transversely of the direction of travel of said web to define therebetween a plurality of slots extending along said open side portion, tracks secured between said walls in alternate said slots leaving the other alternate said slots open between said tracks, continuous belts supported by said tracks in spaced relation between said open slots to provide communication therebetween and through said slots with the interior of said enclosure for applying suction to said web moving thereacross, said belts and said tracks being proportioned to maintain the outer surfaces of said belts spaced beyond the corresponding edges of said walls and forming an interrupted supporting surface for said web across said slots, and drive means connected with said belts for causing continuous movement of substantially one-half of said belts in opposite directions to prevent said moving belts from causing lateral movement of said web and to present a continuously changing surface in engagement with said web.

9. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, a plurality of parallel walls arranged within said enclosure in spaced relation substantially transversely of the direction of travel of said web to define therebetween a plurality of slots extending along said open side portion, tracks secured between said walls in alternate said slots leaving the other alternate said slots open between said tracks, continuous belts supported by said tracks in spaced relation between said open slots to provide communication through said slots therebetween with the interior of said enclosure for applying suction to said web moving thereacross, said belts and said tracks being proportioned to maintain the outer surfaces of said belts spaced beyond the corresponding edges of said walls and forming an interrupted supporting surface for said web across said slots, drive means connected with said belts for causing continuous movement of substantially one-half of said belts in opposite directions to prevent said moving belts from causing lateral movement of said web and to present a continuously changing surface in engagement with said web, tubes extending through said walls inwardly of said tracks and secured to said walls to brace the same, means forming passages connecting each said tube with the interior of said tracks, and means for supplying lubricant to said tubes for transmission through said passages to said tracks to lubricate the areas of contact between said belts and said tracks.

10. A suction box for a traveling web in a paper machine comprising an enclosure adapted to be connected to a source of suction and having an open side portion across which said web is adapted to travel, a plurality of parallel walls arranged within said enclosure in spaced relation substantially transversely of the direction of travel of said web to define therebetween a plurality of slots extending along said open side portion, tracks secured between said walls in alternate said slots leaving the other alternate said slots open between said tracks, continuous belts supported by said tracks in spaced relation between said open slots to provide communication through said slots therebetween with the interior of said enclosure for applying suction to said web moving thereacross, said belts and said tracks being proportioned to maintain the outer surfaces of said belts spaced beyond the corresponding edges of said walls and forming an interrupted supporting surfaces for said web across said slots, drive means connected with said belts for causing continuous movement of substantially one-half of said belts to present continuously advancing flight portions of said belts for engagement with said web and return flight portions within said enclosure, tubes extending through and secured to said walls within said enclosure to brace the same, said tubes having openings therein adjacent and inwardly of said return flight portions of said belts, and means for supplying wash liquid to said tubes for discharge through said openings against said belt portions to wash the same.

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