

March 28, 1950

F. H. BENJAMIN

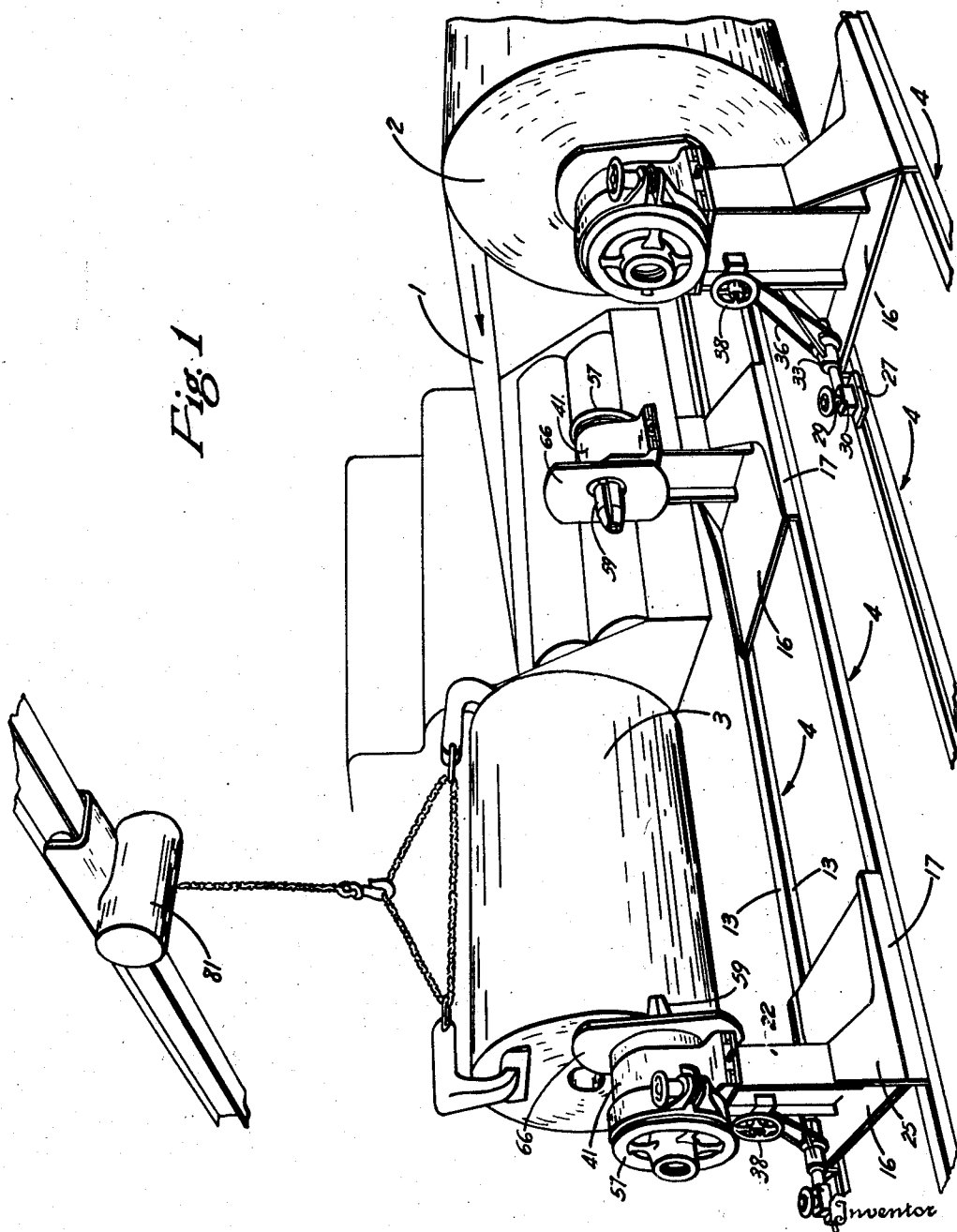
2,501,985

WEB ROLL SUPPORT FOR CORRUGATED PAPERBOARD MACHINES

Filed July 2, 1947

4 Sheets-Sheet 1

Fig. 1



Inventor
Fred H. Benjamin

By ³⁸⁴ Brown, Critchlow, Electro-Beckham
his Attorney

March 28, 1950

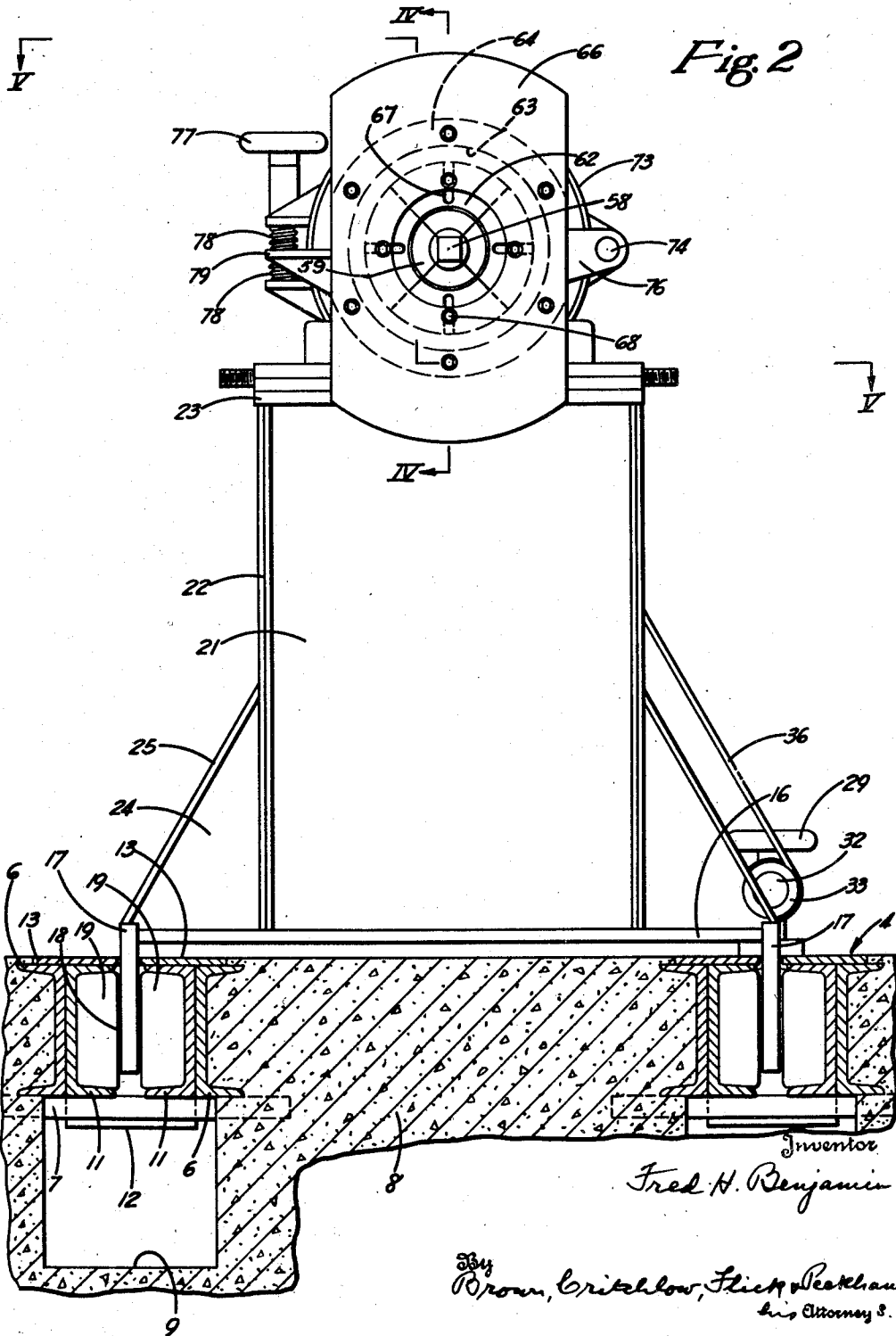
F. H. BENJAMIN

2,501,985

WEB ROLL SUPPORT FOR CORRUGATED PAPERBOARD MACHINES

Filed July 2, 1947

4 Sheets-Sheet 2



March 28, 1950

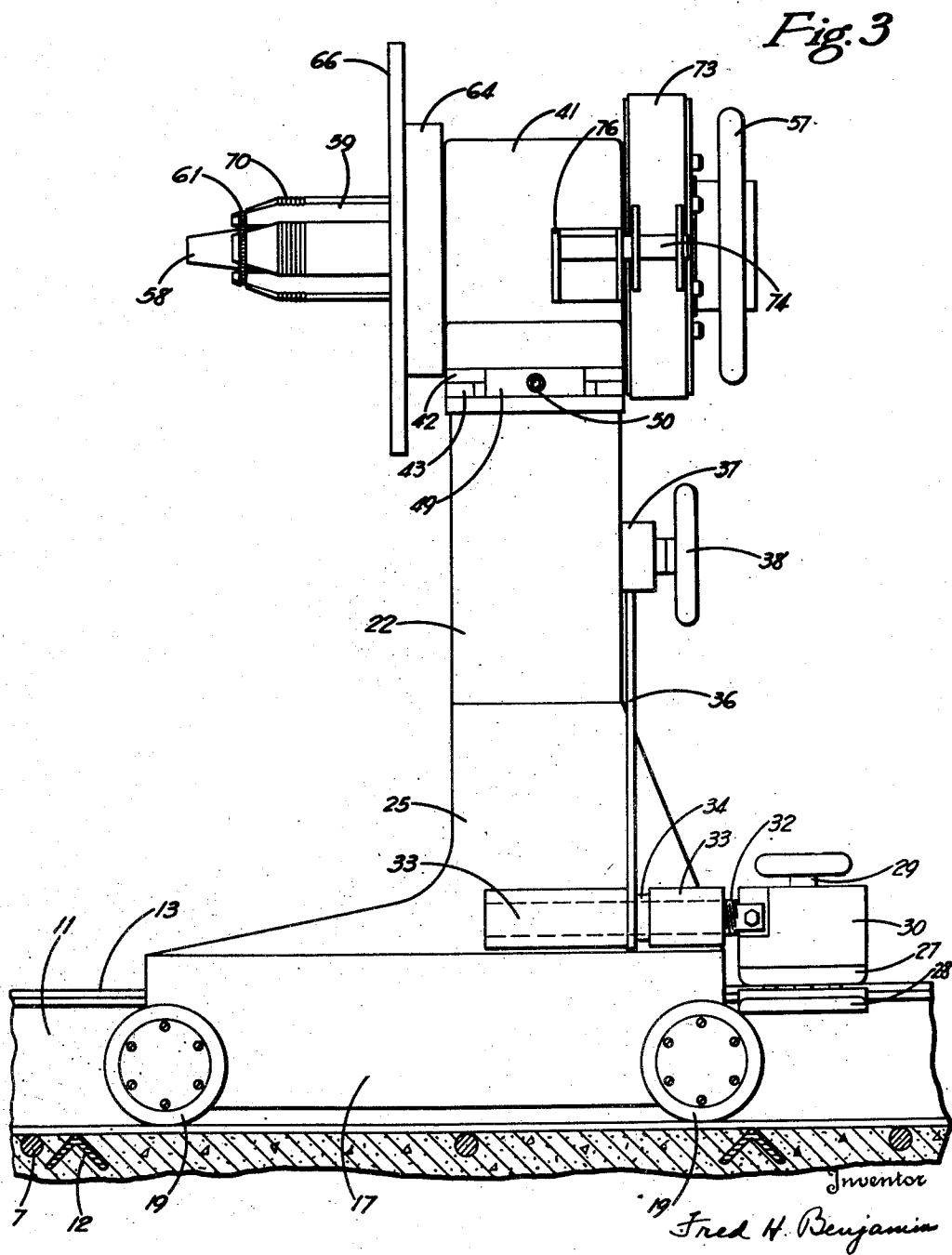
F. H. BENJAMIN

2,501,985

WEB ROLL SUPPORT FOR CORRUGATED PAPERBOARD MACHINES

Filed July 2, 1947

4 Sheets-Sheet 3



By
Brown, Critchlow, Fick & Beckham
his Attorneys

March 28, 1950

F. H. BENJAMIN

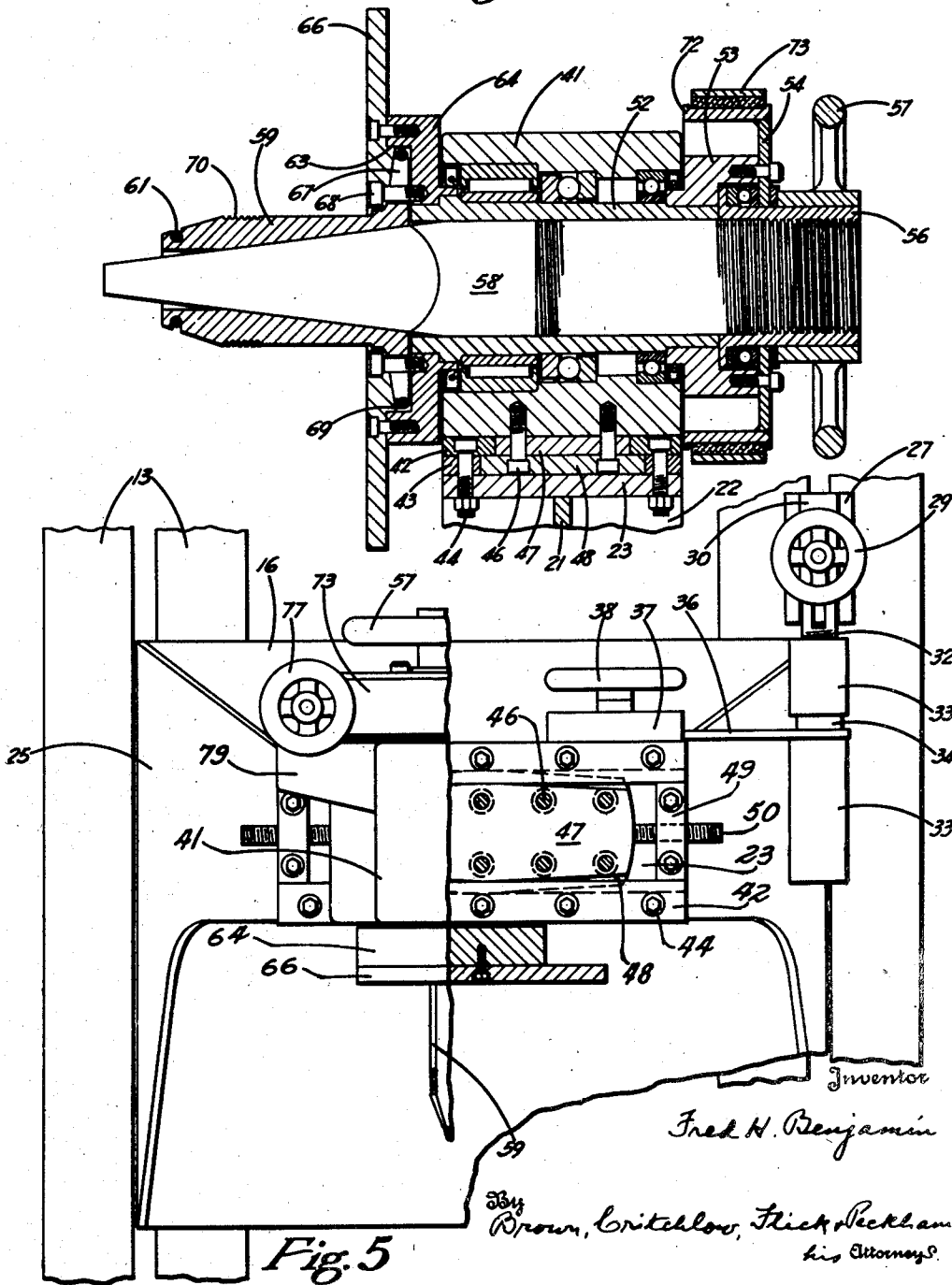
2,501,985

WEB ROLL SUPPORT FOR CORRUGATED PAPERBOARD MACHINES

Filed July 2, 1947

4 Sheets-Sheet 4

Fig. 4



UNITED STATES PATENT OFFICE

2,501,985

WEB ROLL SUPPORT FOR CORRUGATED
PAPERBOARD MACHINESFred H. Benjamin, Wexford, Pa., assignor to F. J.
Kress Box Company, Pittsburgh, Pa., a corpo-
ration of Pennsylvania

Application July 2, 1947, Serial No. 758,670

11 Claims. (Cl. 242—58)

1

This invention relates to supports for web rolls, more particularly the rolls of paper that are fed into corrugated paperboard making machines.

In supplying paper web to a corrugated paperboard machine, it is general practice to pass a metal shaft through the core hole of a web roll and then to drive wedges, that are slidably mounted on the shaft, into the ends of the core hole to center the shaft in the roll. The wedges then are locked on the shaft so that the roll can not turn independently of the shaft. The roll then must be run into unwinding position at one end of or under the machine ready to take the place of another roll as soon as the latter is exhausted. The ends of the shaft are mounted in crude bearings, and a brake is applied to one end of the shaft to control the tension on the paper being unwound from the roll. All of this work requires a considerable amount of time and heavy manual labor. The shafts sometimes become bent, and the inner wraps of the paper are damaged by the wedges cutting into them. Furthermore, the overall length of the machine is considerable because there must be room to receive web rolls moved axially into position beside their bearings before the rolls can be moved radially into the bearings. This system also means that the floor around the machine often is cluttered up with shafts and wedges and the tools used for driving them in place.

To eliminate some of these disadvantages, it has been proposed that the rolls be raised into position between a pair of chucks mounted on supporting stands in line with the machine, but the construction of such apparatus has been complicated and such that both chucks have to be inserted in a roll simultaneously. This requires accurate alignment of the roll between the chucks, which is difficult to obtain, and it also requires the work to be done in a location where there is little room to work. The chuck supports have been connected together in various ways, and the rolls have been held on the chucks by the wedging pressure of the chucks against the outer ends of the core holes, thereby often damaging the ends of the rolls. There has been no satisfactory provision for adjusting the position of a roll when one end of it is wound tighter than the other.

It is among the objects of this invention to provide a web roll support of simple construction which can be loaded in the aisle beside a machine and then moved into position under or at one end of the machine, which can be loaded by a standard overhead lifting device, which includes a pair of independently movable chuck-supporting stands, which allows one end of a roll at a time to be moved onto a chuck, which uses the roll as the only means for connecting the stands together, which has expanding chucks

2

of large roll-engaging areas, which has chucks that are laterally adjustable and self-aligning on their stands, which does not damage the rolls, which prevents telescoping of rolls, which reduces the length of the machine with which it is used, and which is used with an unobstructed floor.

In accordance with this invention, a pair of unconnected stands are mounted for travel along a track extending across a corrugated paperboard machine or the like and laterally into a loading aisle at one side of the machine. A chuck is mounted on each stand and has inwardly projecting expansible portions adapted to project into the opposite ends of the core hole of a web roll that is placed between the chucks while they are in the loading aisle. Means are provided for expanding the chucks to grip the inside of the roll and to support it so that the two chucks will be connected by the roll and will be movable as a unit along the track from the loading position in the aisle to the unwinding position under the machine. A lock may be connected to one of the stands for holding it in any desired position along the track. The track preferably has its upper surface substantially flush with the level of the floor. Each chuck includes a housing slidably and rotatably seated on its stand, and a horizontal hollow arbor rotatably mounted in the housing. A wedge is slidably mounted in the arbor and has a projecting tapered end around which there is a plurality of segmental members which are slidably connected to the arbor so that they can be expanded in a web roll when the wedge is moved inward. A cheek plate is secured to the inner end of the arbor around the segments for engaging the adjoining end of the web roll supported by the two chucks.

The preferred embodiment of the invention is illustrated in the accompanying drawings, in which Fig. 1 is a perspective view of one of my web roll supports in loading position and another of them in unwinding position at one end of a corrugated paperboard machine; Fig. 2 is a view of the inner side of one of the stands with the chuck collapsed and with the track in cross section; Fig. 3 is a side view of the stand with the chuck expanded; Fig. 4 is an enlarged vertical section of a chuck taken on the line IV—IV of Fig. 2; and Fig. 5 is an enlarged horizontal section taken on the line V—V of Fig. 2.

Indicated in Fig. 1 of the drawings is one end of a corrugated paperboard machine to which a web 1 of paper is being delivered from a roll 2 mounted in one of my web roll supports. Another roll 3 is about to be mounted in a like support temporarily located in the aisle beside the machine. When loaded, this roll will be moved under the web 1 leaving the first roll so that the second roll will be ready to feed paper into the machine as soon as the first roll has been ex-

3

hausted. The two web roll supports are identical and, as shown, are disposed parallel and close to each other. One of these supports now will be described.

Starting at the bottom, a track is mounted in the floor and extends from an unwinding position in line with the machine laterally into the loading aisle. As shown in Fig. 2, the track consists of a pair of hollow rails 4, each including a pair of spaced parallel channels 6 connected at their bottoms by cross rods 7 and embedded in the floor 8 above a well 9 into which foreign matter that otherwise might accumulate in the track may fall. Inserted between these two channels is another pair of channels 11 having their flanges facing inward. The webs of these channels engage the webs of the outer channels. The inner channels are spaced apart a short distance by angle bars 12 welded to their lower flanges. Welded to the top of the inner channels are flat plates 13 that rest on top of the outer channels. The upper surfaces of these plates are flush with the surface of the floor so that the track forms neither a projection nor a depression that might cause someone to fall.

Above the track there is a pair of stands, each of which has a horizontal base plate 16 supported by heavy vertical plates 17 secured to its opposite sides and extending down through the slots in the rails. Extending through the opposite ends of the plates inside the rails are short shafts 18 on the ends of which are mounted wheels 19 that travel in the inner channels 11 of the rails so that the stand can be rolled along the track. Mounted on the base of each stand is a pedestal formed from a vertical center plate 21, parallel side plates 22, and a horizontal top plate 23. This pedestal is braced by vertical triangular plates 24, and by inclined plates 25 extending from side plates 22 to the tops of the vertical plates 17 that extend into the rails.

One of the stands is provided with a lock so that it can be held in any desired position along the track. As shown in Fig. 3, the lock includes a pair of clamping shoes 27 and 28, one engaging top plates 13 of a rail 4 and the other located directly below the top flanges of inner channels 11. The lower shoe is supported by a hand screw 29 that is threaded in it and that extends up through the upper shoe and a metal block 30 secured to the upper shoe. When the screw is turned in one direction, the lower shoe is drawn up tight against the rail flanges so that the rail is clamped between the two shoes. Block 30 is attached to the outer end of a threaded horizontal shaft 32 that is slidably mounted in a sleeve 33 secured to the side of the stand. This sleeve is divided into two parts separated by a grooved wheel 34 that is threadedly mounted on the screw between them. An endless belt 36 extends around this wheel and a similar wheel mounted in a bracket 37 attached to the upper part of the stand. This second wheel can be turned by a hand wheel 28, so that after the brake has been locked on the rail in a desired location, the grooved wheel 34 on the stationary threaded shaft 32 can be rotated in order to move the stand forward or backward a short distance on the track to provide fine adjustment of the stand. In this way the web roll can be aligned very accurately with the machine.

Supported by each stand is a chuck housing 41 that, as shown in Fig. 4, rests on parallel bars 42 extending along the inner and outer edges of pedestal plate 23 from which they are spaced

4

by a pair of narrower bars 43. All of these bars are connected by bolts 44 to the top plate of the stand. Secured to the bottom of the housing by means of screws 46 are a pair of plates 47 and 48, one of which engages the inner edges of the upper bars 42 and the other of which engages the inner edges of lower bars 43. As the lower plate projects beneath the upper bars, it locks the housing to the stand. However, the plates are slidable lengthwise of the bars to provide for lateral adjustment of the housing on the stand, and, as shown in Fig. 5, the plates are tapered toward their opposite ends so that the housing can turn on a vertical axis for self-alignment purposes to be described later. Lateral adjustment of the housing is effected by means of horizontal screws 49 threaded in blocks 50 disposed between the ends of the bars and bolted to the top plate of the stand. By loosening either screw and tightening the other, the housing can be pushed across the stand.

Rotatably mounted in suitable thrust and radial bearings in housing 41 is a horizontal hollow arbor 52 on the outer end of which a heavy ring 53 is rigidly mounted. Secured to the outer face of this ring is an annular plate 54 that holds in place an internally threaded sleeve 56 which can be turned in the ring by means of a hand wheel 57 on the outer end of the sleeve. Slidably mounted in the arbor is a plug 58, the outer end portion of which is threaded in the sleeve. The inner end of the plug projects from the arbor and is tapered, preferably being provided with four tapered flat surfaces so that it is square in cross section.

Four segmental wedging members 59 are disposed around the tapered end of the plug, each segment having a longitudinally inclined flat inner surface slidably engaging one of the flat surfaces of the wedge. When the segments are collapsed, their outer surfaces form a cylinder with a tapered inner end. This end is provided with an annular groove in which an endless coil spring 61 is disposed for drawing the segments toward one another. The outer ends of the segments are provided with radial extensions 62 which are retained slidably in a radial recess 63 formed between a ring 64 rigidly mounted on the inner end of the arbor and a vertical cheek plate 66 encircling the segments. Each segment extension 59 is provided with a radial slot 67 through which loosely extends one of the screws 68 that help connect the cheek plate to the adjoining ring. The extensions are encircled by an endless coil spring 69 that urges the segments radially inward toward one another. The cheek plate's inner surface that forms one wall of recess 63 is inclined and engages correspondingly inclined surfaces on the segment extensions so that when the segments are forced apart or expanded by axial movement of the wedge, those sliding surfaces draw the segments toward the arbor. When the wedge is withdrawn by turning hand wheel 57 in the opposite direction, the contraction of springs 61 and 69 causes the segments to slide toward the point of the wedge as they collapse. The segments may be provided with shallow arcuate grooves to form teeth 70 for better gripping of the web roll in which the segments are inserted.

One of the chucks has a brake drum 72 mounted on its annular plate 54, and this drum is partially encircled by a pair of brake bands 73 hinged at one end on a pin 74 projecting from a bracket 76 secured to the side of the chuck housing. The opposite ends of the bands are adjustably connected by a hand screw 77 so that their pres-

5

sure against the brake drum can be adjusted. When the screw is loosened, the bands are swung away from the drum by means of coil springs 78 encircling the screw and compressed between the bands and a bracket 79 projecting from the chuck housing.

In using the apparatus, after a roll of paper has been unwound from the pair of stands that supported it they are pushed along the track until they are out in the aisle at one side of the machine, as shown in Fig. 1. A new roll of paper then is carried into the aisle, such as by a traveling overhead hoist 81 or other suitable device, and the roll is suspended between the two stands with its core hole on a level with the segments 59 of the chucks, which have been collapsed in the meantime. The stand which carries the track clamp (the left-hand stand in Fig. 1) is pushed toward the roll to insert its chuck segments in the adjacent end of the roll. While the cheek plate 66 is being pushed tightly against the end of the roll, the chuck is expanded against the inside of the roll by turning hand wheel 57. As soon as the chuck segments frictionally engage the inside of the roll, their further expansion will cause the engaging inclined surfaces of segment extensions 62 and the cheek plate to draw the cheek plate and roll more firmly against each other. The track clamp then is tightened by turning hand screw 29.

The other stand then is moved toward the opposite end of the roll to insert its chuck in the roll. To align this chuck with the core hole, the roll can be swung to the left or right, using the other chuck as a fulcrum. The second chuck then is expanded in the roll by the sliding plug 58.

The hoist can now be disconnected from the roll which is supported by the two chucks and which forms the only means for connecting the stands. The track lock is released and the two stands and connecting roll are pushed along the track until they are back in their original position in line with the machine. When the roll is in approximately correct position the track lock again is set, and then hand wheel 38 is turned to adjust the stands along the track the slight distance necessary to accurately position the roll.

The tension on the paper being unrolled can be controlled by the brake on one chuck. Also, if the roll happens to have a tight edge, this can be compensated for by adjusting one of the chuck housings laterally by screws 50. Although this will cause the roll to be skewed, the chucks will not bind in the roll because they can turn on their stands and stay in alignment with the axis of the roll.

With this apparatus, a single hoist can be used for loading all of the roll supports. On the other hand, the lack of any base plates or other connections between the stands makes it possible to use a lift rising from floor level between the tracks and the stands. All loading is done in the aisle, so the machine can be shorter. No loose articles that may clutter up the floor are required. This arrangement also permits the loading of rolls without having the stands in fixed position on the tracks or in a fixed relationship with each other, thereby allowing a large latitude in positioning of the rolls to be loaded. The cheek plates tightly engaging the ends of the roll and prevent its center from telescoping, thus permitting better alignment of the roll as the paper runs in the machine. The engagement of the cheek plates with the ends of the roll also cooperates with the engagement of the

6

chuck segments with the inside of the roll to provide plenty of frictional engagement between the roll and chucks without excessive pressure against the inside of the roll. Special diameter core holes or special cores in the holes are not needed because the adjustable chucks are infinitely variable in diameter between predetermined limits. The large area of contact between the chuck segments and the roll distributes the pressure over a large area of the paper and helps to avoid damaging the inside of the roll. The expanding chucks make it unnecessary to push the stands toward the roll to hold the chucks in position. Finally this manner of loading and supporting web rolls and the like is a time saver compared with methods known heretofore.

According to the provisions of the patent statutes, I have explained the principle and construction of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A web roll support comprising a track, a pair of unconnected stands mounted for travel along the track, a chuck mounted on each stand, the chucks having inwardly projecting expansible portions adapted to project into the opposite ends of the core hole of a web roll between the chucks to support it, means for expanding said portions to grip the inside of the roll, whereby the two chucks will be connected by the roll and will be movable as a unit along the track from a loading position to an unwinding position, a screw slidably connected to one of the stands and extending lengthwise of the rails, a locking device connected to the screw and adapted to be locked to the track in any desired position to hold the adjoining stand stationary, a rotatable member threaded on said screw and held against axial movement relative to the adjoining stand, and means for rotating said member when said device is locked on the track to thereby adjust the stand along said screw and track.

2. A web roll support comprising parallel hollow rails adapted to be mounted in a floor with the upper surfaces of the rails in substantially the plane of the floor surface, each rail being provided with a slot through its upper portion extending lengthwise thereof, wheels rotatably mounted inside of said rails, a pair of unconnected stands, connecting members extending through said slots and securing each stand to some of said wheels for travel along the track, a chuck mounted on each stand, the chucks having inwardly projecting expansible portions adapted to project into the opposite ends of the core hole of a web roll between the chucks to support it, and means for expanding said portions to grip the inside of the roll, whereby the two chucks will be connected by the roll and will be movable as a unit along the track from a loading position to an unwinding position.

3. The combination with a corrugated paper-board machine, of a web roll support comprising a track extending across the machine and out into a loading aisle at one side of the machine, a pair of unconnected stands mounted for travel along the track, a chuck mounted on each stand, the chucks having inwardly projecting expansible portions adapted to project into the opposite ends of the core hole of a web roll placed between the chucks in said aisle, and means for expanding

said portions to grip the inside of the roll and support it, whereby the two chucks will be connected by the roll and will be movable as a unit along the track from said aisle into unwinding position in line with the machine.

4. A web roll support comprising a track, a pair of unconnected stands mounted for travel along the track, a chuck housing slidably and rotatably seated on each stand, means for adjusting the housing laterally on the stand, a horizontal hollow arbor rotatably mounted in said housing, a plug slidably mounted in the arbor and having a tapered inner end projecting therefrom, a plurality of segments disposed around said tapered end and slidably connected to the arbor for movement radially thereof, a cheek plate secured to the inner end of the arbor around said segments and adapted to engage an end of a web roll between the two chucks while the segments project into it, and means for moving the tapered plugs inwardly to expand the surrounding segments in the opposite ends of the web roll to support it, whereby the two chucks are connected by the roll and can be moved as a unit along the track.

5. A web roll support comprising a track, a pair of unconnected stands mounted for travel along the track, a chuck housing slidably and rotatably seated on each stand, means for adjusting the housing laterally on the stand, a horizontal hollow arbor rotatably mounted in said housing, a plug slidably mounted in the arbor and having a tapered inner end projecting therefrom, a plurality of segments disposed around said tapered end and slidably connected to the arbor for movement radially thereof, a cheek plate secured to the inner end of the arbor around said segments and adapted to engage an end of a web roll between the two chucks while the segments project into it, means for moving the tapered plugs inwardly to expand the surrounding segments in the opposite ends of the web roll to support it, whereby the two chucks are connected by the roll and can be moved as a unit along the track, and a brake operatively connected to the arbor of one of said chucks.

6. A web roll support comprising a track, a pair of unconnected stands mounted for travel along the track, a chuck housing slidably and rotatably seated on each stand, means for adjusting the housing laterally on the stand, a horizontal hollow arbor rotatably mounted in said housing, a plug slidably mounted in the arbor and having a tapered inner end projecting therefrom, a plurality of segments disposed around said tapered end and slidably connected to the arbor for movement radially thereof, a cheek plate secured to the inner end of the arbor around said segments and adapted to engage an end of a web roll between the two chucks while the segments project into it, means for moving the tapered plugs inwardly to expand the surrounding segments in the opposite ends of the web roll to support it, whereby the two chucks are connected by the roll and can be moved as a unit along the track, a brake operatively connected to the arbor of one of said chucks, and a clamp connected to one of the stands and engaging the track to hold the stand in any desired position along the track.

7. A web roll support comprising a stand, a chuck housing slidably mounted on the stand, horizontal screws threaded in opposite sides of the stand and bearing against said housing for adjusting it laterally on the stand, a horizontal

hollow arbor rotatably mounted in said housing, a wedge slidably mounted in the arbor and projecting therefrom, a plurality of segments disposed around the projecting portion of the wedge and slidably connected to the arbor for movement radially thereof, a cheek plate connected to the inner end of the arbor around said segments and adapted to engage an end of a web roll, and means for moving the wedge inward to expand the surrounding segments in the end of the core hole of the web roll to support it.

8. A web roll support comprising a stand, a chuck housing slidably mounted on the stand, horizontal screws threaded in opposite sides of the stand and bearing against said housing for adjusting it laterally on the stand, an expansible chuck member rotatably mounted on a horizontal axis in said housing and a cheek plate surrounding said member and rotatable therewith for engaging an end of a web roll, said housing being rotatable on said stand for self-alignment with the web roll.

9. A web roll support comprising a stand, spaced parallel bars mounted on top of the stand and extending laterally across it, a plate slidably mounted on the stand between said bars and having convex sides engaging them, horizontal screws threaded in opposite sides of the stand and bearing against the ends of said plate for adjusting it laterally on the stand, a chuck housing rigidly mounted on said plate, an expansible chuck member rotatably mounted on a horizontal axis in said housing, and means for expanding said member in the end of the core hole of a web roll to support it.

10. A web roll support comprising a chuck housing, a horizontal arbor rotatably mounted therein, a plug slidably mounted in the arbor and having a tapered inner end projecting therefrom, a plurality of segments disposed around said tapered end, a cheek plate connected to the inner end of the arbor around said segments and having a recess between it and the arbor, the inner ends of the segments being provided with radial extensions projecting slidably into said recess, and means for moving the plug axially to expand the surrounding segments in the end of a web roll.

11. A web roll support comprising a chuck housing, a horizontal arbor rotatably mounted therein, a plug slidably mounted in the arbor and having a tapered inner end projecting therefrom, a plurality of segments disposed around said tapered end, a cheek plate connected to the inner end of the arbor around said segments and having a recess between it and the arbor, the inner ends of the segments being provided with radial extensions projecting slidably into said recess, and means for moving the plug axially to expand the surrounding segments in the end of a web roll, said segments and cheek plate having slidably engaging inclined surfaces that move the segments axially of the arbor as they are expanded, whereby the segments draw the web roll tightly against the cheek plate.

FRED H. BENJAMIN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,177,577	Mikaelson	Oct. 24, 1939