May 4, 1971 A. G. PIETTE 3,577,316

REPLACEABLE DEFLECTOR BLADE STRUCTURE FOR A PAPERMAKING MACHINE

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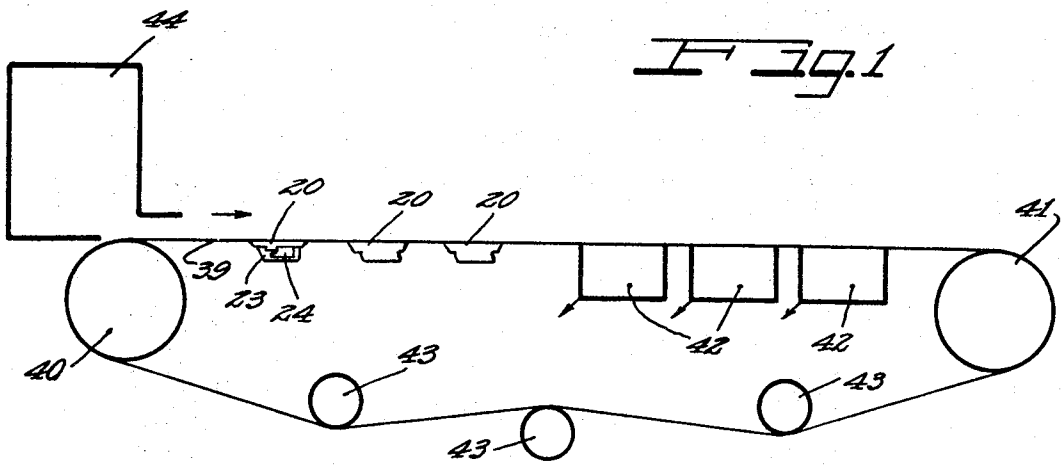


Fig. 1

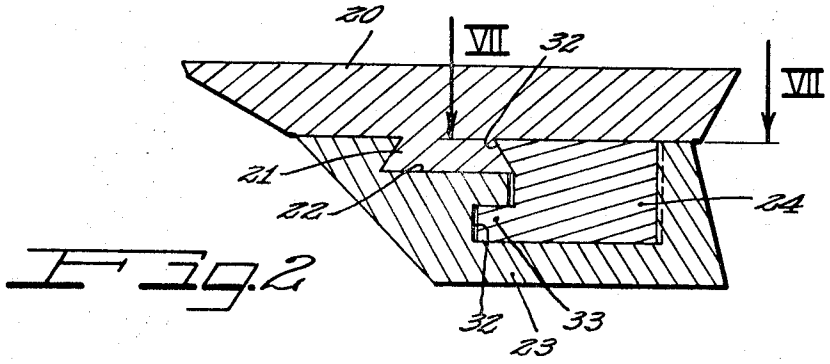


Fig. 2

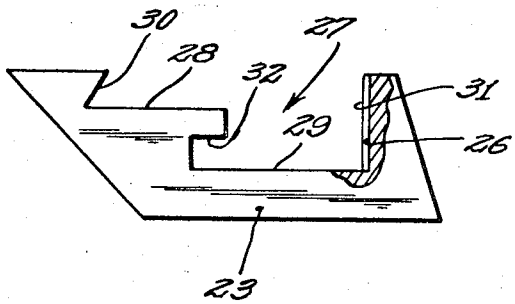


Fig. 3

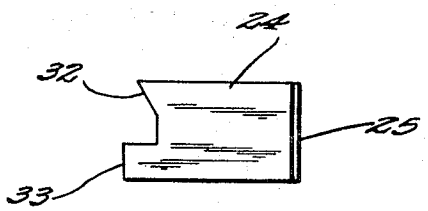


Fig. 4

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Fig. 5

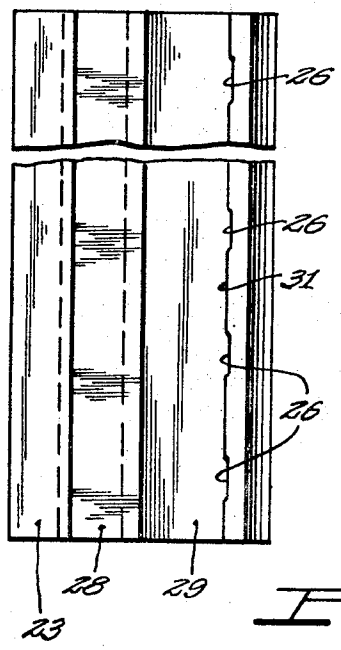


Fig. 6

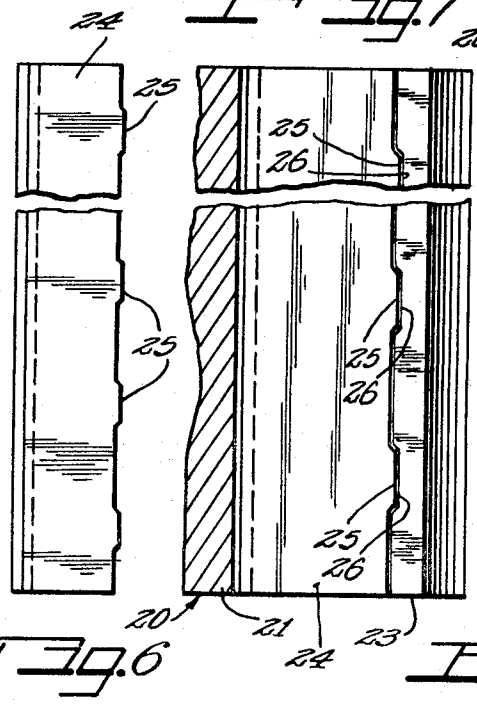


Fig. 7

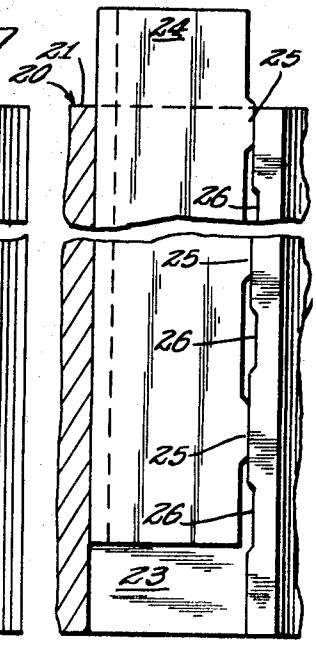
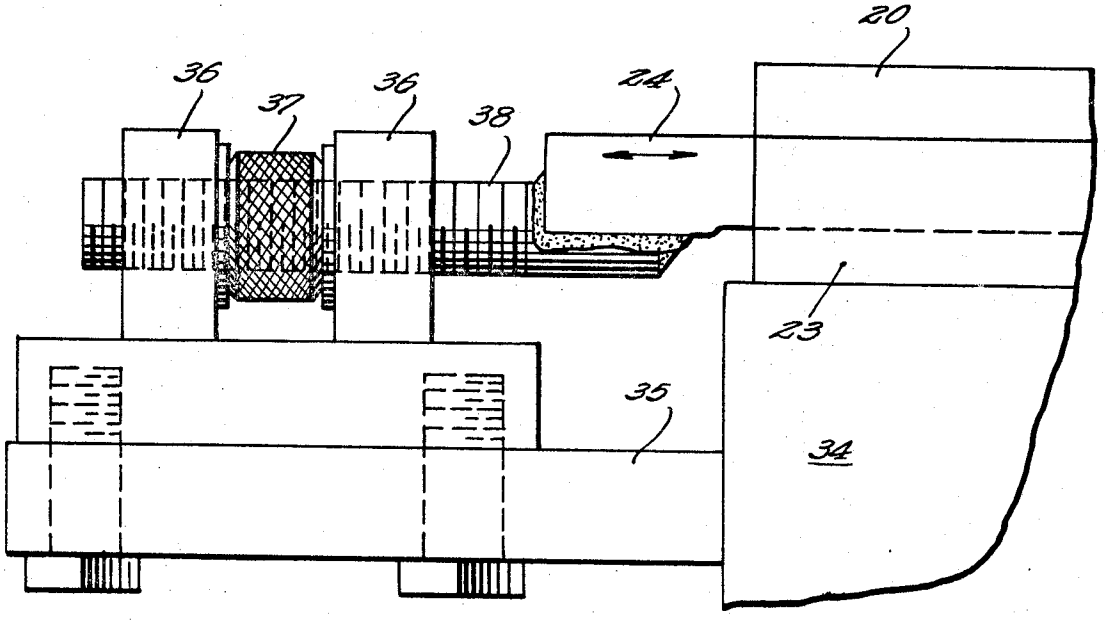


Fig. 8

Fig. 9



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REPLACEABLE DEFLECTOR BLADE STRUCTURE FOR A PAPERMAKING MACHINE

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U.S. Cl. 162—352 5 Claims

ABSTRACT OF THE DISCLOSURE

Arrangement for releasing a foil or deflector blade associated with a traveling Fourdrinier wire to enable the blade to be quickly replaced. The deflector blade, which constitutes a de-watering element, has a dovetail by which it is held on a rail by a dovetail recess formed by the rail and a slide positioned in the rail. Longitudinal position of the slide in the rail determines whether the dovetail recess is narrowed to grip the dovetail of the deflector blade and thereby hold it on the rail or is widened to release the dovetail and thereby permit easy removal of the blade from the rail.

BACKGROUND OF THE INVENTION

The present invention relates to improvements in paper-making machines and more particularly to an improved mounting for a deflector blade constituting a de-watering element positioned beneath a traveling Fourdrinier wire.

It has been customary in paper-making machines having a traveling Fourdrinier wire, to provide one or more deflector blades between suction flat boxes and a breast roll, the deflector blades serving as de-watering devices for the paper slurry deposited on the traveling wire from a headbox located near the breast roll. It has proved desirable for the purposes of repair or replacement that the deflector blades be quickly and easily removed from their supports. Yet during operation of the paper-making machines it has been important for the deflector blades to be securely held in their supports. The blades are of considerable length which has contributed to the difficulties of firm holding of the blades and quick removal thereof.

It is an object of the present invention to provide an improved arrangement by which a deflector blade is firmly and fixedly held in position during operation and yet is easily removed from its support, which arrangement involves an adjustable dovetail groove that can be easily widened to release a dovetail on the blade and easily narrowed to grip the dovetail of the blade.

Other and further important objects of this invention will become apparent from the attached drawings and the detailed description following the brief description of the drawings.

SUMMARY OF THE INVENTION

A deflector blade has a dovetail held in a dovetail groove formed between a rail support and a slide that is longitudinally shiftable along the dovetail groove. Engaging regions of the slide and the support rail are provided with recesses and projections so that when the slide is in one position with respect to the rail, the recesses and projections are out of engagement with one another and the dovetail groove is narrowed to grip the dovetail of

the deflector blade, and in another position of the slide with respect to the rail the recesses and projections engage one another and the dovetailed groove is widened to release the dovetail of the deflector blade. When the dovetail groove is narrowed and firmly grips the dovetail of the deflector blade, the blade is firmly held in position in the rail. When the dovetail recess is widened so as to release the dovetail of the deflector blade, the blade may be easily removed by being slid lengthwise out of the rail.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic elevational view of a paper-making machine of which the deflector blade and the improved mounting thereof of the present invention are a part.

FIG. 2 is a transverse sectional view showing the mounting of the deflector blade on a rail and a slide.

FIG. 3 is an end view, with two portions broken away in section, of the rail.

FIG. 4 is an end view of the slide.

FIG. 5 is a plan view of the rail.

FIG. 6 is a plan view of the slide.

FIG. 7 is a fragmentary sectional view taken on the line VII–VII of FIG. 2, showing the cooperating recesses of the rail and the slide in engagement with one another.

FIG. 8 is a sectional view similar to FIG. 7, but showing the recesses and projections of the slide and rail out of engagement with one another.

FIG. 9 is a fragmentary side view showing the parts by which the slide is moved longitudinally with respect to the rail.

As shown in FIG. 2, a deflector blade **20** has a dovetail **21** positioned in a dovetail channel **22** formed by and between a rail **23** and a slide **24**, which constitutes a locking means. Longitudinal position of the slide **24**, i.e., into and out of the plane of FIG. 2, with respect to the rail **23**, determines whether the channel **22** is narrowed to grip or lock the dovetail **21** or is widened to release the dovetail.

As shown in FIGS. 7 and 8, the slide **24** has a plurality of projections **25** distributed in spaced relationship along its length, and the rail **23** has a plurality of recesses **26** distributed along its length in spaced relationship, which recesses mate with the projections **25** on the slide **24**. When the slide **24** and the rail **23** are in the relative position of FIG. 7, the projections **25** are in mating engagement with the recesses **26**, and the slide **24** is as far to the right as viewed in FIG. 7 as it can go with respect to the rail **23**, with the result that the dovetail channel **22** is widened to release the dovetail **21** of the deflector blade **20**. Thus the deflector blade **20** can be removed longitudinally from the rail **23**, i.e. by upward or downward movement as viewed in FIG. 2, i.e., by movement perpendicular to the plane of FIG. 2. When the slide **24** and the rail **23** are in the relative position of FIG. 8, the projections **25** are out of engagement with the recesses **26** and in engagement with regions adjacent and between the recesses so that the slide **24** is moved to the left as viewed in FIG. 8, with the result that the dovetail channel **22** is narrowed to grip the dovetail **21** of the deflector blade **20**.

As shown in FIG. 3, the rail **23** has a longitudinal groove **27** composed of a shallow portion **28** and a deep

portion 29. The shallow portion 28 of the groove has a sloping undercut side 30 which is away from the deep portion 20. The deep portion 20 of the groove 27 has a side 31 which is away from the shallow portion 28 and in which the recesses 26 are formed. The deep portion 29 of the groove 27 has at one side a shallow region 32 which is adjacent and beneath the shallow region 28 of the groove.

As shown in FIG. 4, the slide 24 has on the side away from the projections 25, a sloping undercut surface 32 and a shallow ledge 33, both extending longitudinally of the slide. When, as shown in FIG. 2, the slide 24 and the rail 23 are assembled, the ledge 33 of the slide 24 is received in the shallow region 32 of the deep portion 29 of the groove 27 in which it fits. The dovetailed channel 22 is formed by the shallow portion 28 of the groove 27 in the rail 23 and is defined at its sides by the undercut surface 30 on the slide 23 and the undercut surface 32 on the slide 24.

As shown in FIG. 9, the rail 23 is secured to a body 34. Either or both of these parts constitute a supporting frame means. A bracket 35 is secured to one end of the body 34 and includes spaced ears 36. A knurled nut 37 is rotatably mounted on and between the ears 36 so as to be permitted rotative movement with respect to the ears and to be held against axial movement with respect thereto. A threaded rod 38 is secured to one end of the slide 24, projects freely through the spaced ears 36, and has threaded engagement with the nut 37. Rotation of the nut 37 produces longitudinal movement of the threaded rod 38 and the slide 24 between the positions of FIGS. 7 and 8. The nut 37 and rod 38 constitute means for shifting the locking means or slide 24.

As shown in FIG. 1, one or more foils or deflector blades 20 in conjunction with their associated rails 23 and slides 24 may be used in a papermaking machine that includes a Fourdrinier wire 39 in the form of a loop, a breast roll 40 in one end of the loop, a couch roll 41 within the other end of the loop, one or more suction devices 42 beneath the upper side of the loop, and a plurality of return rolls 43 within and without the lower side of the loop, and a headbox 44 adjacent the breast roll 40 and outside the loop. The deflector blades 20 are located beneath the upper side of the loop of the wire 39 between the breast roll 36 and the suction devices 42 and serve as dewatering devices. A paper web is formed on the traveling wire 39 on the outer surface of its upper side and is supplied by the headbox 44. As the paper web moves to the right as viewed in FIG. 1, water is removed therefrom by the deflector blades 20 and the suction devices 43. The paper web is picked off the traveling wire 39 by a pickup felt (not shown) adjacent the couch roll 41.

It will be appreciated that the deflector blades 20 must be held very firmly during operation of the papermaking machine. Each deflector blade 20 is firmly held in the rail 23 by the slide 24 when the slide and rail are in the relative position of FIG. 8 in which the projections 25 on the slide are out of engagement with the recesses 26 in the rail 23. Thus, the slide 24 is to the left as viewed in FIG. 8, and the dovetail channel 22 formed between the rail 23 and the slide 24 is narrowed to grip the dovetail 21 of the detector blade 20.

When the deflector blade 20 is to be removed from its rail 23 and slide 24, rotation of the nut 37, shown in FIG. 9, acts through the threaded rod 38 to move the slide 24 longitudinally and thus to bring about the relative position of the slide 24 and the rail 23 illustrated in FIG. 7. In this position, the projections 25 engage the recesses 26 and the slide 24 is to the right as viewed in FIG. 7, with the result that the dovetail channel 22 is widened and releases its grip on the dovetail 21 of the blade 20. Now the blade is easily moved longitudinally out of the rail 23 and slide 24.

The repaired blade or the new blade is positioned in the rail 23 and slide 24, and the slide 24 is shifted by rotation of the nut 37 from the position of FIG. 7 to that of FIG. 8 to narrow the dovetail channel 22. The channel now grips the dovetail 21 of the blade 20, and the machine is again ready for operation.

The drawings and specification present a detailed disclosure of the preferred embodiment of the invention, and it is to be understood that the invention is not limited to the specific form disclosed, but covers all modifications, changes, and alternative constructions falling within the scope of the principles taught by the invention.

I claim:

1. In a papermaking machine, an assembly comprising:
   - (a) a de-watering device extending across the paper machine beneath the Fourdrinier wire,
   - (b) a supporting frame means for carrying the de-watering device,
   - (c) a locking means for holding the de-watering device rigidly in the frame against displacement with respect thereto in the machine direction, and
   - (d) displacing means for shifting the locking means in the cross-machine direction to loosen the de-watering device in the machine direction and thereby to enable it to be easily removed from the frame means by movement in the cross-machine direction,
   - the supporting frame means and the locking means having mating projections and recesses distributed in the cross-machine direction, the projections and recesses being out of engagement when the de-watering device is held against movement in the cross-machine direction and in the machine direction, operation of the displacing means bringing the projections and recesses into engagement for loosening of the de-watering device in the supporting frame means.

2. An assembly according to claim 1, wherein the de-watering device has a dovetail, the supporting frame means and the locking means jointly form a dovetail channel receiving the dovetail of the de-watering device, the groove is narrowed to grip the dovetail by disengagement of the projections and recesses from one another, and the groove is widened to loosen the dovetail by engagement of the projections and recesses with one another.

3. An assembly according to claim 2, wherein the grooves are formed on the supporting frame means and the projections are formed on the locking means.

4. In a papermaking machine, an assembly comprising:
   - (a) a deflector blade extending in the cross-machine direction and having a longitudinal dovetail extending in the same direction,
   - (b) a support rail having a longitudinally extending groove composed of shallow and deep portions extending side by side along the groove,
   - (c) a slide positioned in the deep portion of the groove and extending therealong,
   - one side of the slide and the shallow portion of the groove cooperating so as to form a dovetail channel engaging the dovetail on the deflector blade,
   - the other side of the slide and the side of the deep portion of the groove away from the shallow portion thereof having mating projections and recesses distributed in the cross-machine direction, the said one side of the slide underlying a side of the deep portion of the groove adjacent the shallow portion thereof, and
   - (d) means for shifting the slide longitudinally in the cross-machine direction in the groove between a position in which the projections and recesses are out of engagement with one another and the dovetail channel is narrowed to grip the deflector blade, and a position in which the projections and recesses engage one another and the dovetail channel is widened to

loosen its grip on the dovetail of the deflector blade.

5. An assembly according to claim 4, further comprising:

(a) a body secured to the rail,

(b) a bracket secured to the body and having spaced ears,

the means for displacing the slide longitudinally comprising a knurled nut rotatably mounted be- the ears and held against axial movement with respect thereto, and a threaded rod secured to one end of the slide and extending through the spaced ears freely and through the nut in threaded engagement therewith.

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U.S. Cl. X.R.

162—211; 287—64