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54 **A booksewing thread stitcher machine.**

57 A booksewing thread stitcher machine (1), affording an increased production rate and quieter operation, comprises a frame structure (5), a sewing station (11), a moving saddle (10) mounted on a movable mechanism (13) adapted to be displaced angularly around a pivot pin (14), drives (15) for driving the movable mechanism (13) and saddle (10)

toward and away from the sewing station (11), and a box-type body (16) attached to the frame structure (5) and having said pivot pin (14) passed therethrough, within said box-type body (16) there being housed said drives (15) in oil bath.

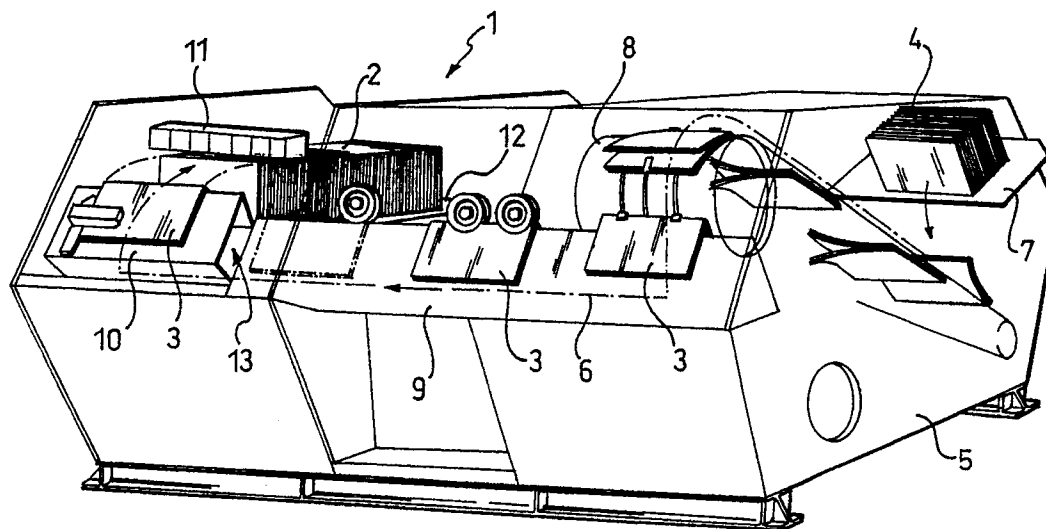


FIG.1

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This invention relates to a booksewing thread stitcher machine comprising, within a frame structure, a sewing station, a moving saddle mounted on a movable mechanism adapted to swing around a pivot pin, and drives for driving the movable mechanism and saddle toward and away from the sewing station.

Booksewing on such a machine is performed from signatures, with one signature at a time being picked up from a signature loading deck and taken by the moving saddle to a book-forming deck on which the delivered signature will be stitched to other signatures by means of a sewing station.

Prior machines currently in use have a drawback in that they disallow in practice enhanced throughput due to any increase in the machine speed having proved impractical. In fact, any increase in speed would result in unbearable noise emission from the movable mechanism and the drives.

Consequently, to achieve a high book-making rate, it has been necessary to renounce sewing and adopt glueing methods.

The problem that underlies this invention is to provide a booksewing thread stitcher machine which has such structural and functional characteristics as to overcome the above-noted shortcomings.

This problem is solved by a machine as indicated being characterized in that it comprises a box-type body attached to the frame structure and having said pivot pin passed therethrough, said box-type body housing said drives in oil-bath setup.

Further features and the advantages of a machine according to the invention will be apparent from the following detailed description of a preferred embodiment thereof, given by way of illustration and not of limitation with reference to the accompanying drawings, where:

Figure 1 is a perspective view showing schematically a machine according to the invention;

Figure 2 is a detail perspective view of the machine shown in Figure 1;

Figure 3 is a part-sectional view of the same detail as shown in Figure 2, taken along the line III-III; and

Figure 4 is a view of the same detail as shown in Figure 2, viewed in the direction of the arrow IV.

With reference to the drawing views, generally indicated at 1 is a booksewing thread stitcher machine whereon a book 2 would be formed by sewing signatures, collectively denoted by 3, together as picked up from a stack 4 of signatures 3.

The machine 1 comprises, within a frame structure 5, a signature travel path 6 extending between the stack 4 and the book 2.

The machine 1 further comprises, arranged within the frame structure 5 along the signature path 6, a loading deck 7 for the stack 4 of signatures to be sewn, a conveyor 8, a stationary saddle 9, a moving saddle 10, a sewing station 11, and a collecting deck 12 for signatures 3 sewn into books 2.

The moving saddle 10 is mounted on a mechanism 13 of bridge-like configuration with side abutments 13a and a cross-piece 13b, to which the moving saddle 10 is attached. The mechanism 13 can be swung around a pivot pin, generally shown at 14 and having an axis X-X, by the action of drives, generally shown at 15, which are arranged to act on the mechanism 13 to shift the mechanism 13 and moving saddle 10 between a first position, shown by a dash-and-dot outlined in the drawing, where the moving saddle 10 locates exactly in continuation of the stationary saddle 9 remotely from the sewing station 11, and a second position, shown in full outline in the drawing, where the moving saddle 10 locates in working alignment to the sewing station 11 remotely from the stationary saddle 9.

The booksewing stitcher machine 1 of this invention also comprises a box-type body 16 which is secured on the frame structure 5, is provided at an intermediate location to the abutments 13a, and has the pivot pin 14 passed therethrough.

The box-type body 16 houses the drives 15 in an oil-bath 0 type of setup.

In a preferred embodiment of the invention, the pivot pin 14 comprises an axle 17 having its ends attached to the frame structure 5 and a hollow cylindrical shaft 18 which is received rotatably on the axle 17. The hollow shaft 18 is made fast with the mechanism 13. Specifically, it has its ends attached to the free ends of the side abutments 13a, and is passed rotatably through the box-type body 16 with the intermediary of cylindrical through-going bushes 19 which are provided conventionally with seals, not shown, to prevent oil from leaking out of the box-type body 16.

Defined in the hollow shaft 18 is an intermediate portion 18a fully enclosed within the box-type body 16.

Advantageously, the drives 15 comprise two flat cams 20 and 21 which fit over a camshaft 22 having an axis Y-Y, fast therewith.

The shaft 22 is carried rotatably within the box-type body 16, with the axis Y-Y parallel to the axis X-X, with the intermediary of bearings 23 provided with seals and known per se, in order to prevent oil from leaking out of the box-type body 16.

At least a section 22a of the shaft 22 extends outwards from the box-type body 16.

The drives 15 further comprise two throws 24 and 25 having respective first ends 26, 27 and

respective second ends 28, 29. The first ends 26 and 27 of the throws 24 and 25 are made fast with the intermediate portion 18a of the hollow shaft 18

The second ends 28 and 29 of the throws 24 and 25 carry respective rollers 30 and 31 which are in rolling engagement with the cams 20 and 21, respectively.

The profiles of the cams and throw positioning are selected such that continued rotation of the shaft 22 carrying the cams will result in angular reciprocation of the hollow shaft 18 carrying the throws, and hence of the mechanism 13, through an angular excursion A. At extreme values of said angular excursion A, the moving saddle 10 will reach its first position in continuation of the stationary saddle (9) and its second position at the sewing station (11), respectively.

The above-described stepless rotation of the shaft 22 is provided by a motive means 32 which comprises an electric motor 33 supported on the frame structure 5 and acting on the section 22a of the shaft 22 via a speed reduction arrangement, generally shown at 34, which in the example illustrated would comprise a pair of drives, each of the belt-and-pulley type.

In operation of this machine, signatures 2, being successively transferred from the stationary saddle 9 to the moving saddle 10 on the latter coming into alignment with the stationary saddle, will be taken one at a time to the sewing station by the moving saddle being shifted from the first position to the second, as imposed by the action of the cams 20 and 21 on the throws 24 and 25. Also by the action of the cams on the throws, the saddle will be then returned to the first position from the second.

In the course of this operation, the cams and throws are constantly lubricated and cooled by the oil bath 0 provided in the box-type body 16.

It should be noted that the drives will act on the movable mechanism 13, and hence the saddle 10, through the hollow shaft 18 of the pivot pin 14.

A major advantage of the inventive machine is that it has afforded increased rates of moving saddle angular displacement, and accordingly a higher throughput, while keeping operation remarkably quiet.

As an added advantage of a machine according to the invention, longer troublefree life with no wear may be expected of it.

Understandably, the machine described in the foregoing may be altered and modified in many ways by a skilled one in the art to meet specific and contingent demands without departing from the true scope of the invention as set forth in the appended claims.

Claims

1. A booksewing thread stitcher machine (1) comprising, within a frame structure (5), a sewing station (11), a moving saddle (10) mounted on a movable mechanism (13) adapted to swing around a pivot pin (14), and drives (15) for driving the movable mechanism (13) and saddle (10) toward and away from the sewing station (11), characterized in that it comprises a box-type body (16) attached to the frame structure (5) and having said pivot pin (14) passed therethrough, said box-type body (16) housing said drives (15) in oil-bath setup.
2. A machine according to Claim 1, characterized in that the pivot pin (14) comprises an axle (17) affixed to the frame structure (5) and a hollow shaft (18) made fast with the movable mechanism (13) and journaled on said axle (17).
3. A machine according to Claim 2, characterized in that the drives (15) comprise two flat cams (20,21) mounted on a camshaft (22) extending parallel to said pivot pin (14) and two respective throws (24,25), each throw (24,25) having a first end (26,27) attached to the hollow shaft (18) and a second end (28,29) provided with a roller (30,31) in rolling engagement with a respective one of the cams (20,21)
4. A machine according to Claim 3, characterized in that the camshaft (22) has one end (22a) protruding out of said box-type body (16) and connected to a motive means (32).

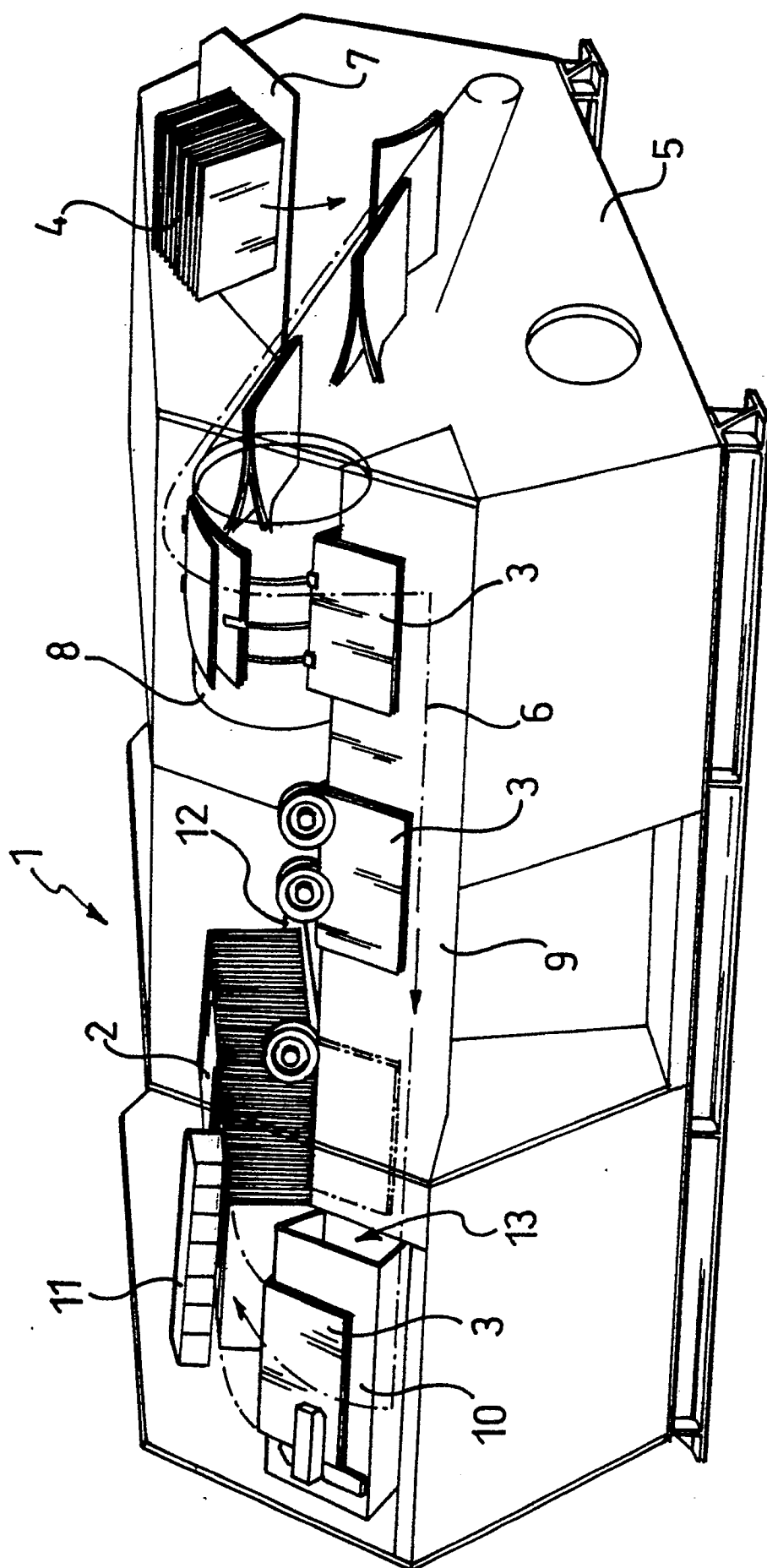


FIG.1

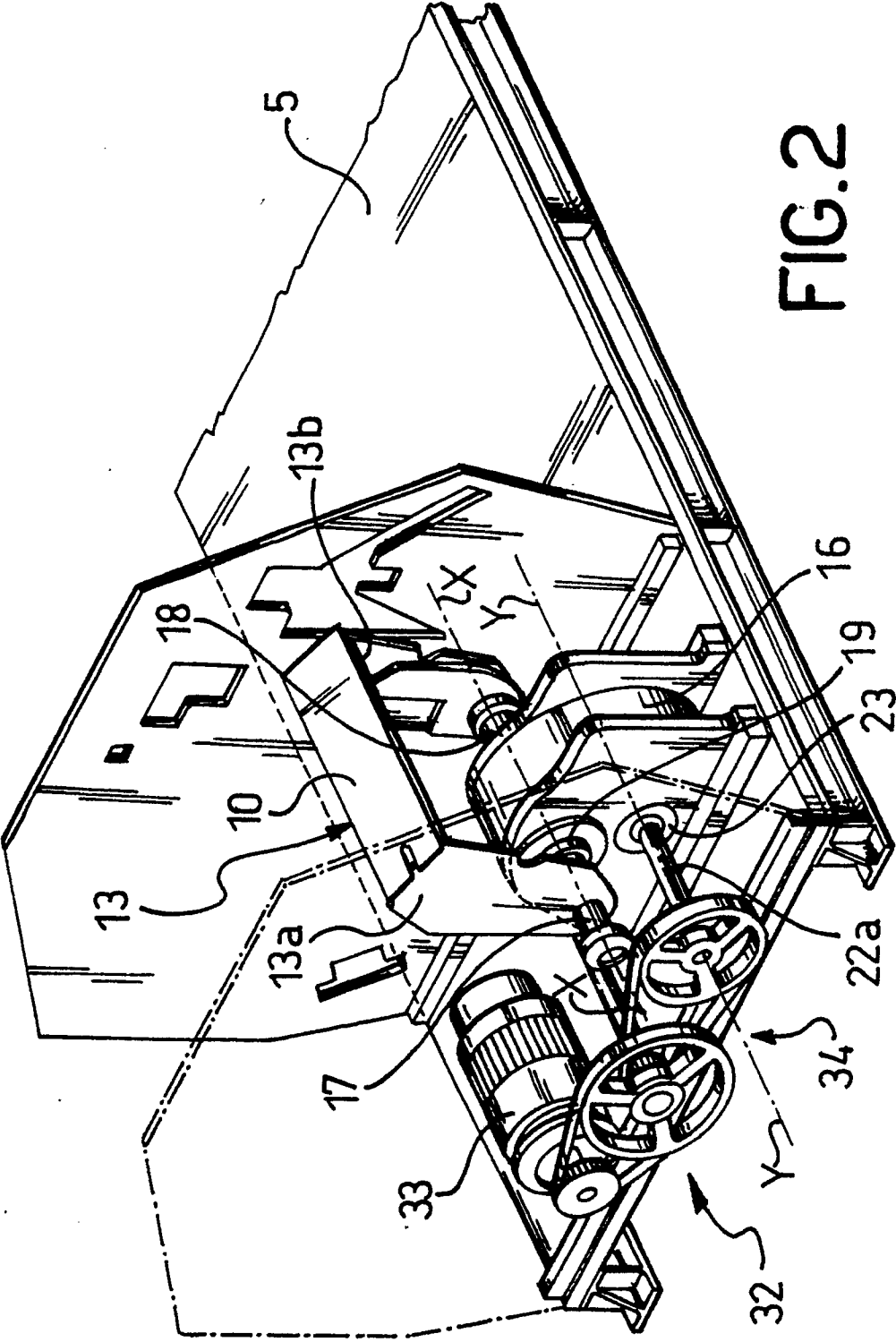


FIG. 2

