

July 22, 1941.

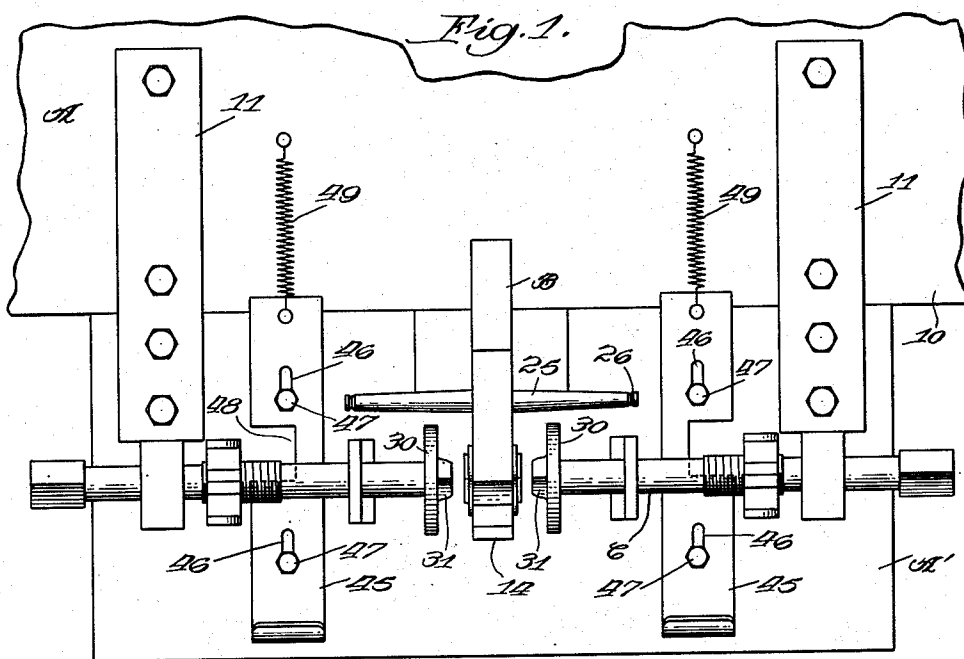
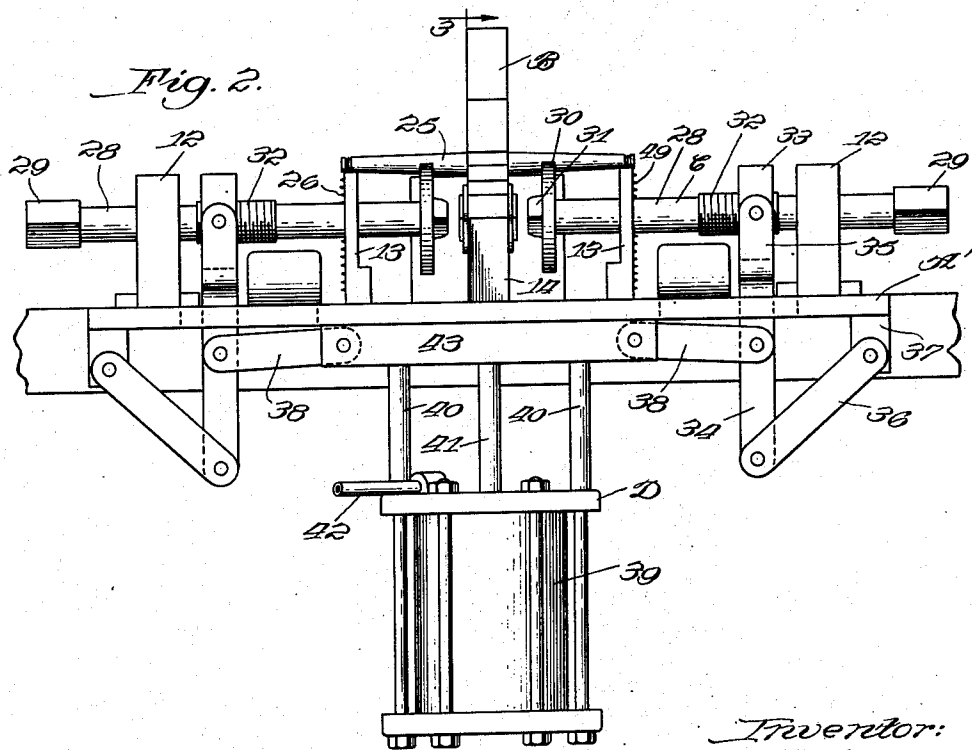
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2,249,984

SWAGING APPARATUS FOR CORES AND SPOOLS

Filed Oct. 4, 1940

2 Sheets-Sheet 1



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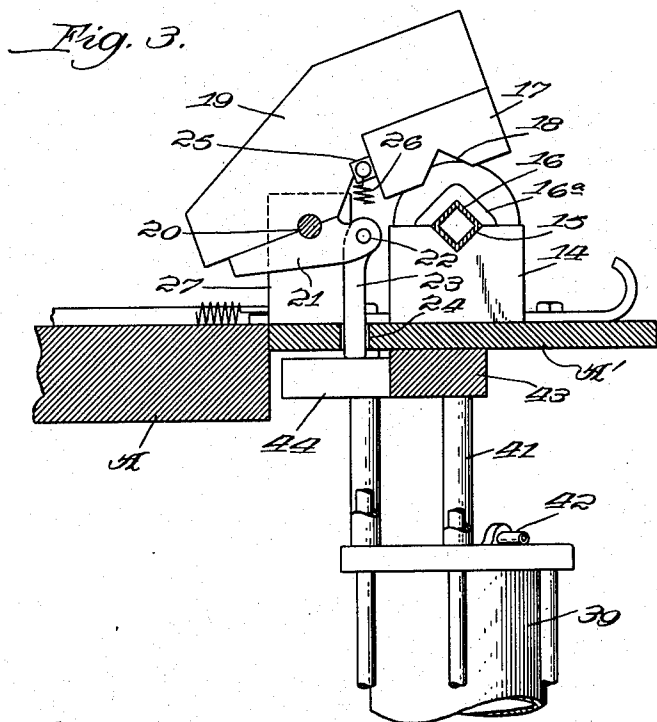
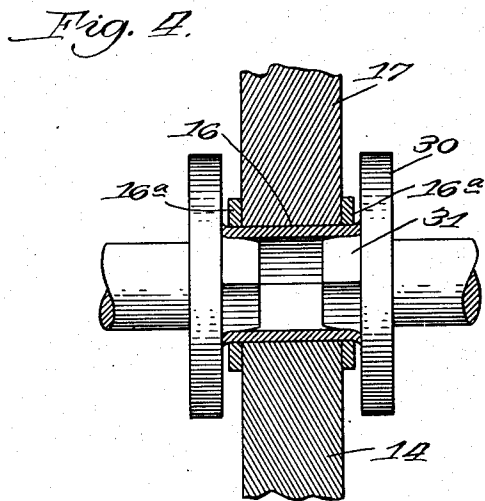
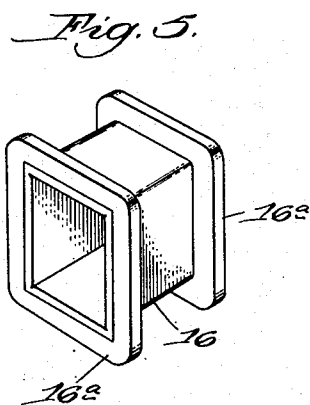
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SWAGING APPARATUS FOR CORES AND SPOOLS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,249,984

SWAGING APPARATUS FOR CORES AND SPOOLS

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Application October 4, 1940, Serial No. 359,807

9 Claims. (Cl. 93—1)

This invention relates to swaging apparatus for cores, spools, bobbins and the like, and more particularly to cores, spools or bobbins adapted to receive coil windings, etc.

An object of the invention is to provide simple and effective apparatus for swaging the ends of cores so as to permanently lock flanges upon the cores. A further object is to provide means for swaging the ends of paper cores to provide locking means for shoulders or sides which are permanently held upon the cores to retain windings thereon. Other specific objects and advantages will appear as the specification proceeds.

The invention is illustrated, in a preferred embodiment, by the accompanying drawings, in which—

Figure 1 is a top plan view of apparatus embodying my invention; Fig. 2, a front view in elevation; Fig. 3, a sectional detail view, the section being taken as indicated at line 3 of Fig. 2; Fig. 4, an enlarged detail sectional view showing the manner of supporting the core; and Fig. 5, a perspective view of the finished core, spool, or bobbin.

In the apparatus illustrated, A designates a frame equipped with a front shelf A'; B, core-supporting apparatus; C, swaging apparatus; and D, power mechanism.

The frame A may be of any suitable type or construction. In the illustration given, a machine bed or frame 10 is shown, to which is secured a shelf A' by means of metal straps 11. Upon the shelf A' is mounted a pair of end standards 12 perforated to receive the operating plungers or bars hereafter described. Inner standards 13 are also provided, each being perforated for supporting the plunger or shafts mentioned.

The core-supporting apparatus, in the illustration given, comprises a foundation block 14 having a recess 15 adapted to receive the lower portion of the core indicated by the numeral 16. In the illustration given, the core is square in shape and the notch in the block 14 is V-shaped to receive the lower half portion of the core. A movable upper block 17 is provided with a recess 18 corresponding to recess 15 of block 14, the two recesses being complementary for receiving the core 16. The upper block 17 is carried by a rectangular support 19 pivotally mounted upon shaft 20. Both of the blocks 14 and 17 are secured to their respective supports by means of bolts (not shown) so as to permit removal thereof and the substitution of other support members with recesses of different shapes adapted

to receive cores of different shapes. It will be noted that blocks 14 and 17 are narrow so as to leave the end portions of the core upon which the end flanges are placed unconfined.

The movable support 19 is provided with a lower bracket member 21 having an ear portion 22 extending beyond the pivot 20 and to which is fixed a downwardly extending post or finger 23. The member 23 extends through an enlarged opening 24 in the shelf A'. Secured to the supporting member 19 is a laterally extending bar 25 to the ends of which are secured springs 26, the lower ends of the springs being secured to the shelf A' and normally urging the bar 25 and the support 19 downwardly to bring the block 17 into confining engagement with the core. The movable support 19 extends between a pair of standards 27 carried by the shelf A', and the pivot 20 extends through the standards 27 and the member 19 therebetween.

The swaging mechanism C may be of any suitable construction. In the illustration given, a plunger or bar 28 is mounted in each pair of standards 12 and 13 on opposite sides of the support 14. Each of the bars 28 at its rear end portion is provided with a square end 29 adapted to receive a wrench for adjusting the bars, as will be later described. Each of the shafts 28 is provided at its forward end with a disk 30 and a flared end portion 31 just ahead of the disk 30. As shown more clearly in Fig. 4, the flared head portion 31 is adapted to be received within the core 16 and to turn the end portion outwardly, just prior to its engagement by the circular flange head 30.

Each shaft or plunger 28 is provided centrally with a threaded portion 32, and a circular nut 33 is mounted on each threaded portion. A link member 34 is provided at its upper end with a yoke 35 having its arms pinned to opposite sides of the member 3. The lower end of the link 34 is connected pivotally by link 36 to a stud 37 carried by shelf A'. An operating link 38 has one end pivotally connected to the link 43 at a central point.

The power means D may be of any suitable type or construction. Treadle or other manually operated means may be employed. An electric motor or other suitable power means may be used. In the illustration given, a compressed air cylinder 39 is suspended by supports 40 from the shelf A'. While any suitable form of power means may be employed, the cylinder illustrated consists of a piston (not shown) which is provided at its upper end with a plunger 41 and

which is exposed to the atmosphere on its lower side. A spring (not shown) normally urges the piston to its upper position. Compressed air is admitted through the valve-controlled pipe 42 to the upper end of the cylinder so as to depress the piston against the force of the spring.

The plunger 41 engages an upper operating bar or block 43, to the rear portion of which is pivotally connected at each end one of the operating links 38. Extending rearwardly from the block 43 is a support 44 adapted to maintain the finger or post 23 in the upper position illustrated in Fig. 3 except when the plunger 41 is depressed.

Each of the swaging plungers or bars 28 is locked in the retracted position shown in Figures 1 and 2 by a slide bar 45. Each slide bar is provided with a pair of elongated slots 46 through which a bolt 47 extends. The slide bar is provided with a cut-out portion 48 which, when aligned with the link 34, permits the plunger 28 to be forced inwardly or outwardly. A spring 49 is attached to each of the metal straps 45 and to a post carried by the bed A, thus normally moving the matching straps or bars 45 to locking position.

Operation

In the operation of the machine, the valve controlling the compressed air pipe 42 is closed and a spring within the power cylinder normally urges the plunger 41 to its upper position, illustrated in Fig. 3. In this position, the support member 44 maintains the post 23 in the position illustrated in Fig. 3 and thus causes the upper block 17 to be tilted to the open position shown. The operator is thus free to insert a core 16 within the V-recess 15, with the side flanges 16^a of the core resting on the free ends of the core. The operator then, by means of a foot treadle or any other valve-operating means, admits compressed air to the top of the power cylinder 39 and the piston is depressed, carrying the plunger 41 downwardly and the support 44 likewise downwardly. As the support 44 recedes, the finger 23 passes downwardly through the opening 24 and allows the block 17 to swing to closed position, thus confining the core 16 in the position shown more clearly in Fig. 4. At the same time, the downward movement of the member 43 pulls inwardly upon the link 34 by means of connecting link 38 and thus swings the yoke 35, the nut 33, and plunger 28 secured thereto inwardly. As each plunger 28 moves inwardly, the flared head portion 31 engages the inner portion of the core, as shown in Fig. 4, and the circular flange heads 30 press the now outwardly curved end portions of the core outwardly into engagement with the flanges 16^a of the core, thus anchoring the flanges thereon and against removal. When the operator releases the power, after the swaging operation, the spring within the cylinder again presses plunger 41 upwardly and the support 44 presses finger 23 upwardly to tilt the block 17 out of engagement with the lower block 14. The operator is now free to remove the finished core and place a new core assembly thereon.

The apparatus is extremely simple, sure, and accurate in operation.

While in the foregoing description, I have set forth certain details of construction, as illustrative of the apparatus, it will be understood that such details may be varied widely without departing from the spirit of my invention.

I claim:

1. In apparatus for swaging the ends of cores to lock flanges permanently thereon, a frame, a core support receiving the body portion of the core but leaving free the flange-carrying end portions, a pivotally mounted clamp above said support and adapted to confine the core thereon, slidably mounted plungers aligned with said core on opposite sides of said support, swage heads having enlarged rear portions carried by said plungers and adapted to enter said cores and press outwardly the end edge portions thereof, and means for bringing said heads into engagement with said cores and simultaneously moving said clamp to confining position and for simultaneously retracting said plungers and moving said clamp to non-confining position.

2. In apparatus for swaging the ends of cores to lock flanges permanently thereon, a frame, a core support receiving the body of the core but leaving free the flange-carrying end portions, means for releasably confining the core upon said support, spring means urging said last-mentioned means toward confining position, slidably mounted plungers carried by said frame for longitudinal movement and supported on opposite sides of said support in alignment with said core, power means for reciprocating said plungers, and means actuated by said power means for maintaining said confining means in inoperative position except when said plungers are reciprocated toward said core.

3. In apparatus for swaging the ends of cores to lock flanges permanently thereon, a frame, a core support receiving the central portion of the core but leaving free the flange-carrying end portions, means for confining the core upon said support, plungers mounted in said frame for slidable movement toward and away from said core, said plungers being provided with threaded portions, a nut engaging the threaded portion of each plunger, means for rotating the plunger to adjust the nut thereon, link members engaging said nuts, and means for operating said link members to reciprocate said nuts and the plungers carried thereby.

4. In apparatus for swaging the ends of cores to lock flanges permanently thereon, a frame, a core support consisting of at least two parts, one which is movable and adapted to receive the body portion of the core, leaving free the flange-carrying end portions, means for operating the movable portion of said support after a core has been placed therein for enclosing the body portion of the core, a pair of slidably mounted plungers carried by said frame in alignment with the channels of said core, link members secured to each of said plungers, connected link members secured to said first-mentioned link members, and power means for operating said actuating link members to slide said plungers simultaneously toward or away from said core.

5. In apparatus for swaging the ends of cores to lock flanges thereon, a frame, a core support receiving the body portion of the core but leaving free the flange-carrying end portions, clamping means for confining said core upon said support, spring means normally urging said clamp toward said core support, releasable locking means maintaining said clamp away from said core support to permit a core to be inserted thereon, slidably mounted plungers carried by said frame in alignment with the channel of said core and adapted to engage opposite sides of said core, swage heads carried by said plungers, means

for operating said plungers toward and away from said core, and means for releasing said clamp to permit the same to engage said core when said plungers are operated and before they engage the ends of said core.

6. In apparatus for swaging the ends of cores to lock flanges thereon, a frame, a core support receiving the body portion of the core but leaving free the flange-carrying end portions, means for confining the core upon said support, slidably mounted plungers on opposite sides of said support and carried by said frame in alignment with the channel of said core, swage heads carried by said plungers for engagement with said core, latch means preventing inward movement of said plungers for engagement with said core, and means for moving said plungers into core-engaging position when said latch means is released.

7. In apparatus for swaging the ends of cores to lock flanges thereon, a frame, a core support upon said frame and provided with a notch adapted to receive the central portion of the core leaving free the flange-carrying end portions, a pivotally mounted clamp member provided with a notch complementary to the notch of said support for engaging the upper portion of the core, means urging said clamp toward said support, slidably mounted plungers carried by said frame on opposite sides of said core and in alignment with the channel thereof, swage heads carried by the inner ends of said plungers, link mechanism for providing said plungers inwardly simultaneously, said link means being connected to a common actuating bar, a power cylinder provided with a piston and a stem, the outer end of said stem being engaged to said common actuating bar, and means for operating said piston by a differential in pressure fluids.

8. In apparatus of the character set forth for swaging the ends of paper cores to lock flanges permanently thereon, a frame, a core support thereon adapted to receive the central portion of a core, leaving free the flange-carrying end portions, said flanges upon the ends of the core being brought into abutting relation with the sides of the support, a pivotally mounted member above said support and adapted to confine said core upon said support, means normally urging said pivotally mounted member toward said support, plungers slidably mounted in said frame for movement toward and away from said core and being provided with heads adapted to engage the ends of said core to swage the same against the flanges thereof, means for moving said plungers toward and away from said core simultaneously, and automatic means for opening and closing said pivotally mounted member above said support.

9. In apparatus for swaging the ends of cores to lock flanges permanently thereon, a frame, a core support receiving the body portion of the core but leaving free the flange-carrying end portions, a movably mounted clamp above said support and adapted to be brought into confining relation about the core, slidably mounted plungers aligned with said core on opposite sides of said support, swage heads carried by said plungers and adapted to enter said cores and press outwardly the end edge portions thereof, means for bringing said heads into engagement with said cores and simultaneously moving said clamp to confining position, and means for retracting said plungers and moving said clamp to non-confining position.

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