June 23, 1964 J. B. GOODGAME 3,138,236

CHAIN FOR FLATS OF CARDING MACHINES

Filed April 26, 1962

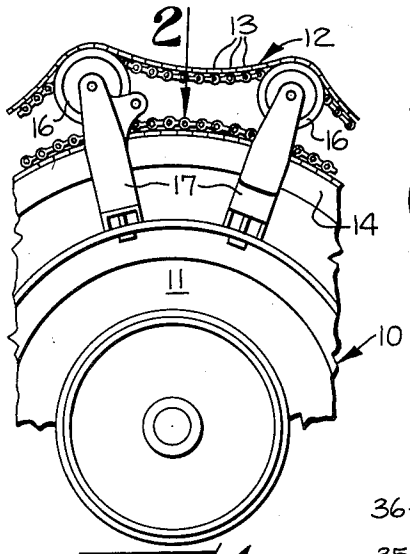


Fig-1

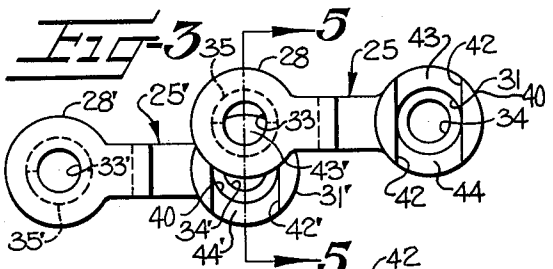


Fig-3

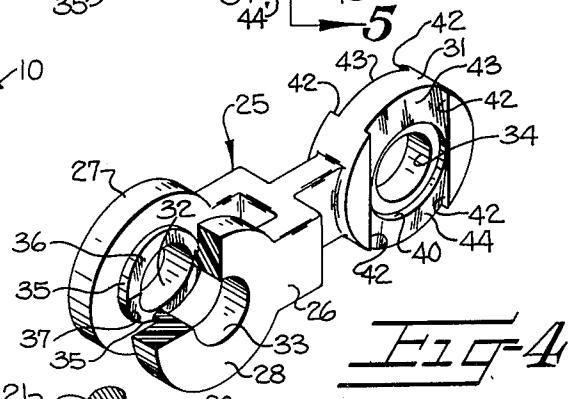


Fig-4

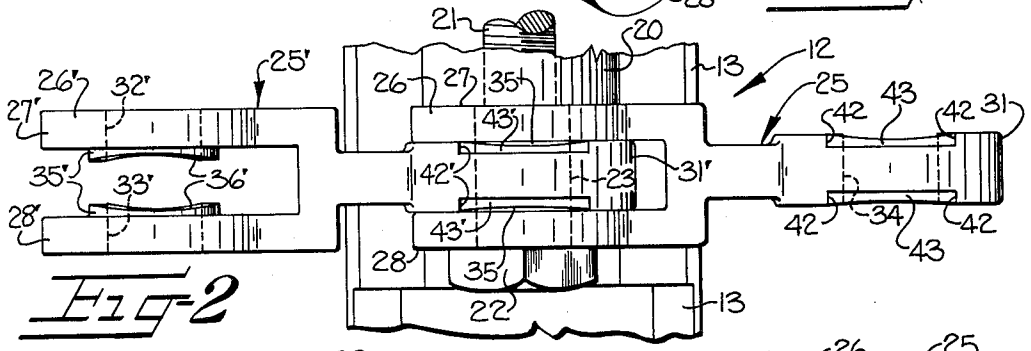


Fig-2

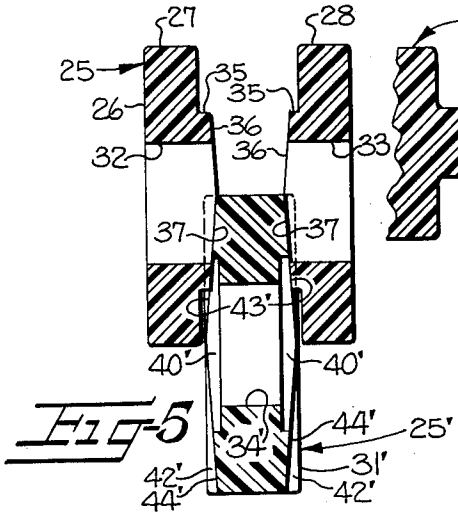


Fig-5

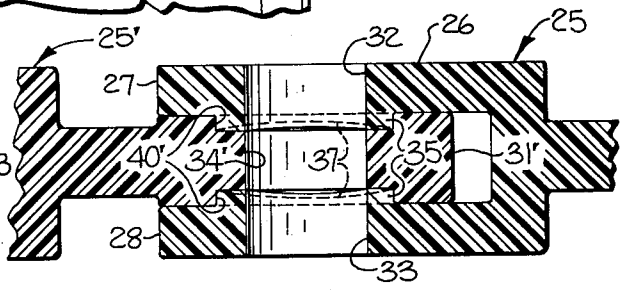


Fig-6

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CHAIN FOR FLATS OF CARDING MACHINES

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This invention relates to link chains and more especially to an improved chain construction particularly devised for supporting and moving the ends of the flats of a textile carding machine.

It is an object of this invention to provide a new and improved link chain construction which may include an even or odd number of links without the use of a special offset link therein and wherein adjacent links are readily assembled by simply snapping or pressing them together.

It is a more specific object of this invention to provide a new and improved link chain construction, each of the links of which may be of identical construction, one end being of reduced width to form an arm or stem to be received between the arms of an opposite bifurcate or clevis-shaped end of an adjacent link, with cooperating cam surfaces, bosses and recesses on the links to facilitate interconnecting adjacent links by simply snapping or pressing them together without the necessity of extending a pin through adjacent links until such time as an element, such as a card flat, is to be connected thereto.

Each link of the present chain construction is so designed as to be molded in a single piece from plastic or metal and the preferred embodiment of each link of the present invention has a boss on the inner face of each arm of the bifurcate end thereof. Opposed sides of the other arm or stem each has a circular recess therein for loosely receiving the circular bosses of an adjacent link therein. The stem has inclined cam surfaces on each side thereof formed by a laterally extending shallow groove alined with the recesses, and each boss is also laterally beveled or inclined in a manner complementary to the stem to form cam surfaces thereon. The cam surfaces are so formed that, during assembly of such links, the lateral grooves in the stem are positioned in alinement with the bosses of an adjacent bifurcate end and the stem is then moved laterally inwardly between the arms of the bifurcate end, during which the cam surfaces on opposed sides of the stem engage corresponding cam surfaces on the proximal surfaces of the bosses to force the arms apart until the bosses and recesses are in axial alinement, whereupon the arms will snap inwardly and move the bosses into the corresponding recesses to pivotally interengage the adjacent links.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds, when taken in connection with the accompanying drawings, in which—

FIGURE 1 is a fragmentary side elevation of the central portion of a carding machine, showing portions of the main cylinder, the flats and the improved card flat chain in association therewith;

FIGURE 2 is an enlarged fragmentary plan view looking down in the general direction of the arrow 2 of FIGURE 1, showing a portion of one of the card flats and two adjacent interconnected chain links of the present invention;

FIGURE 3 is an elevation of the two chain links shown in FIGURE 2 in the process of being assembled, and omitting the card flat and the corresponding shoulder screw or pivot pin;

FIGURE 4 is an isometric view of one of the improved links with a portion of one of the arms of the bifurcate end thereof broken away for purposes of clarity;

FIGURE 5 is an enlarged fragmentary vertical sectional view taken substantially along line 5—5 in FIGURE 3;

FIGURE 6 is a longitudinal sectional plan view through the proximal ends of the links shown in FIGURE 2, but omitting the card flat and the shoulder screw.

Referring more specifically to the drawings, the numeral 10 generally designates a textile carding machine of the type generally known as a revolving flat card and which has a driven rotary main cylinder 11 whose periphery is covered with the usual card clothing material, not shown, and whose upper portion moves relative to a pair of continuously driven endless card flat chains, only one of which is shown broadly designated at 12. The card flat chain embodies the present invention as will be later described and supports corresponding ends of card flats 13 having the usual card clothing thereon, not shown.

As is usual, the card flats 13, moving with the lower runs of the chains 12, ride against the upper curved surface of the frame 14 of the carding machine 10 and the card flats 13 in the upper runs of the chains 12 are guided on suitable rollers 16 journaled in brackets 17 carried by the frame 14. As shown in FIGURE 2, each card flat 13 has a boss portion or enlarged portion 20 spaced inwardly from each end thereof and which is internally threaded for receiving the threaded end 21 of a shoulder screw or pin 22, the body or enlarged portion of which is indicated at 23 and extends through the overlapping proximal portions of a corresponding pair of the improved links.

Although each link of the chain 12 may be identical and both links shown in FIGURES 2, 3, 5 and 6 are of identical construction, one of the links will be described in detail and like parts associated with the other or next adjacent link shall bear the same reference characters with the prime notation added for purposes of clarity. Accordingly, the link in the right-hand portions of FIGURES 2, 3 and 6 shall be generally designated at 25 and the link in the left-hand portions of FIGURES 2, 3 and 6 is generally designated at 25'. Link 25 is also shown in FIGURE 4.

Link 25 comprises a bifurcate body portion 26 forming laterally spaced arms 27, 28 thereon, each of which is preferably substantially circular. The body portion 26 also has an arm 31 integral therewith and extending outwardly therefrom in the direction opposite from the arms 27, 28 thereof. For purposes of clarity, arm 31 shall also be termed as a stem. The free end of stem 31 is preferably of circular form and of substantially the same diameter as the circular portions of the arms 27, 28. Of course, the link could be of the same width throughout its length, if desired. However, the link 25 is preferably in the form illustrated in the drawings so as to accommodate the usual rollers associated with carding machines, such rollers usually being provided with flat surfaces on the peripheries thereof which fit between the enlarged circular end portions of the corresponding links.

The major portions of the arms 27, 28 of the body 26 of link 25 are spaced apart from each other a distance substantially equal to or greater than the thickness of the enlarged portion of the stem 31 so that the portion 31' of the adjacent link 25', for example, will loosely fit between the arms 27, 28 as shown in FIGURE 2. The arms 27, 28 of the body 26 have respective alined holes 32, 33 therethrough which are adapted to be alined with and are of the same diameter as a hole 34 provided through the stem 31 of an adjacent link 25 or 25' (see FIGURE 6).

The proximal or inner surfaces of the arms 27, 28 of link 25 have circular bosses 35 thereon which are of substantially lesser diameter than the diameter or width of the corresponding arms 27, 28, but which are of substantially greater diameter than the bores or holes 32, 33 through the arms 27, 28. Each of the bosses 35 is relatively thick diametrically thereof, along a line substantially parallel to the longitudinal axis of the corresponding link 25, and has laterally inclined cam surfaces 36, 37 extending laterally from the ridge or central portion thereof. The cam surfaces 36, 37 are so inclined that the diametrically opposed portions of each boss 35 transversely of the diametrical ridge thereof are relatively thin or diminish to infinity.

Each side of stem or arm 31 has a circular recess 40 therein which is concentric with the bore or hole 34 therethrough and which is of a depth at its deepest point substantially equal to the thickness of the thickest portion of each boss 35. The diameter of each recess 40 is sufficiently larger than the diameter of the corresponding bosses 35 to insure that the bosses of an adjacent link may readily swivel or rotate within the recesses 40.

Each side of the enlarged rear portion of the stem 31 has a relatively shallow lateral groove 42 therein which is of a width substantially the same as the diameter of the recesses 40 and whose bottom is inclined laterally outwardly in opposite directions from a point corresponding to the longitudinal axis of the link 25; that is, at a diametrical portion of each recess 40 corresponding to the diametrical ridge of each boss 35. Thus, each groove 42 is relatively deep at the distal portions of the corresponding stem 31 while it may taper or be beveled to infinity at its juncture with the wall of the corresponding recess 40, thus forming a pair of laterally opposed cam surfaces 43, 44 on each side of the enlarged rear portion of the stem 31.

Now, in order to connect the stem 31' of link 25' to the bifurcate body 26 of link 25, the grooves 42' in opposed sides of the stem 31' of link 25' are alined with and positioned to one side of or laterally of the bosses 35 between the arms 27, 28 of link 25 substantially as shown in FIGURES 3 and 5. Thereupon, the corresponding ends of the links 25, 25' are moved laterally relative to each other to cause the surfaces 43', for example, on opposite sides of the stem 31', to slide against the proximal cam surfaces 37, for example, on the bosses 35 of the two arms 27, 28.

In so doing, it is apparent that the arms 27, 28, which have some inherent flexibility therein, are forced apart from each other so that, ultimately, the distance between the diametrical ridges of the two bosses 35 is very nearly equal to the width of the enlarged portion of the stem 31'. Thereupon, the bosses 35 will then register with the recesses 40' and the arms 27, 28 will snap inwardly to position the bosses 35 within the recesses 40', thus completing the attachment of the stem of link 25' to the bifurcate body 26 of the link 25. It is apparent that the bores 32, 33, 34' are then axially alined with each other so that the enlarged medial portion 23 of shoulder screw or pin 22 may be readily inserted therethrough to permit the links 25, 25' to pivot on the shoulder screw 22.

Because it is desirable that these links 25, 25' may be manually squeezed together in assembling the same, it is desirable that they are molded from Bakelite, fiberboard,

nylon or a similar plastic material of the desired yieldability. However, it is apparent that they may be molded from metal, leather or other material without departing from the spirit of the invention.

Although the recesses 40 and grooves 42 are shown in opposite sides of the separate arm 31 and the bosses 35 are shown on the proximal surfaces of the parallel arms 27, 28, it is apparent that the recesses and grooves may be provided in arms 27, 28 and the bosses may be provided on arm 31 without departing from the spirit of the invention.

In the drawings and specification there has been set forth a preferred embodiment of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A link construction for a chain comprising
(a) a bifurcate body having a pair of first arms thereon,
(b) a second arm extending from said body in substantially the opposite direction from said first arms,
(c) a boss projecting inwardly from at least one of said first arms,
(d) said second arm having a circular recess in at least one side thereof,
(e) a cam surface on the end of said boss opposite from said one of said arms and being so inclined that the boss is thicker at one diametrical portion thereof than it is at a point transverse of the diametrical portion and at the edge of the boss, and
(f) said one side of the second arm also having a relatively shallow lateral groove therein of a width substantially the same as the diameter of said recess with the bottom of said groove being inclined outwardly from the adjacent edge of said recess to the distal surface of said second arm and with the groove being deeper at the distal surface of said second arm than it is at the recess.

2. A link chain construction comprising
(a) a plurality of interconnected links,
(b) each link having a pair of laterally spaced arms on one end thereof,
(c) a single arm on the other end of each link and loosely positioned between said pair of arms of an adjacent link whereby adjacent arms have relatively movable proximal surfaces thereon,
(d) the proximal surface of one arm having a circular recess therein,
(e) the proximal surface of the adjacent arm having a boss thereon loosely fitting within said recess,
(f) said proximal surface of one arm having a groove therein extending radially from said recess but being of a depth substantially less than the depth of the recess at the recess and tapering to a depth substantially equal to that of the recess at the distal edge of said surface remote from the recess,
(g) said groove being of a width substantially equal to the diameter of said recess, and
(h) at least a portion of said boss having an inclined surface thereon complementing the bottom of the groove in said proximal surface of one arm.

3. A link construction for a chain comprising
(a) a bifurcate body having a pair of first arms,
(b) a second arm extending from said body in the opposite direction from said first arms,
(c) a boss projecting inwardly from at least one of said arms,
(d) another of said arms having a circular recess in at least one side thereof and being of a diameter such as to loosely receive a corresponding boss of an adjacent link therein,
(e) a cam surface on the end of said boss opposite from said one of said arms and being so inclined

that the boss is thicker at one diametrical portion thereof than it is at a point transverse of the diametrical portion and at the edge of the boss, and

(*f*) said other of said arms also having a relatively shallow groove therein of a width substantially the same as the diameter of said recess with the bottom of said groove being inclined from the adjacent edge of said recess to the distal outer surface of said other of said arms and with the groove being deeper at the distal outer surface of said other of said arms than it is at the recess.

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