

[54] SELF-SUPPORTING ARTICULATED CHAIN

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59/91; 248/49, 51, 52

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[57] ABSTRACT

A self-supporting articulated chain composed of identical links pivoted to one another, each link terminating at its opposite ends on one side of its longitudinal center plane in parallel abutment edges and on the other side of such plane in obliquely disposed abutment edges, alternate ones of the links having cover members of such length as to project beyond both ends of its associated link to provide a cover for the gap which exists between adjacent links. One end of each link is displaced laterally by an amount corresponding to its wall thickness and the longitudinal edges of each link are bent to form edges of double wall thickness.

8 Claims, 5 Drawing Figures

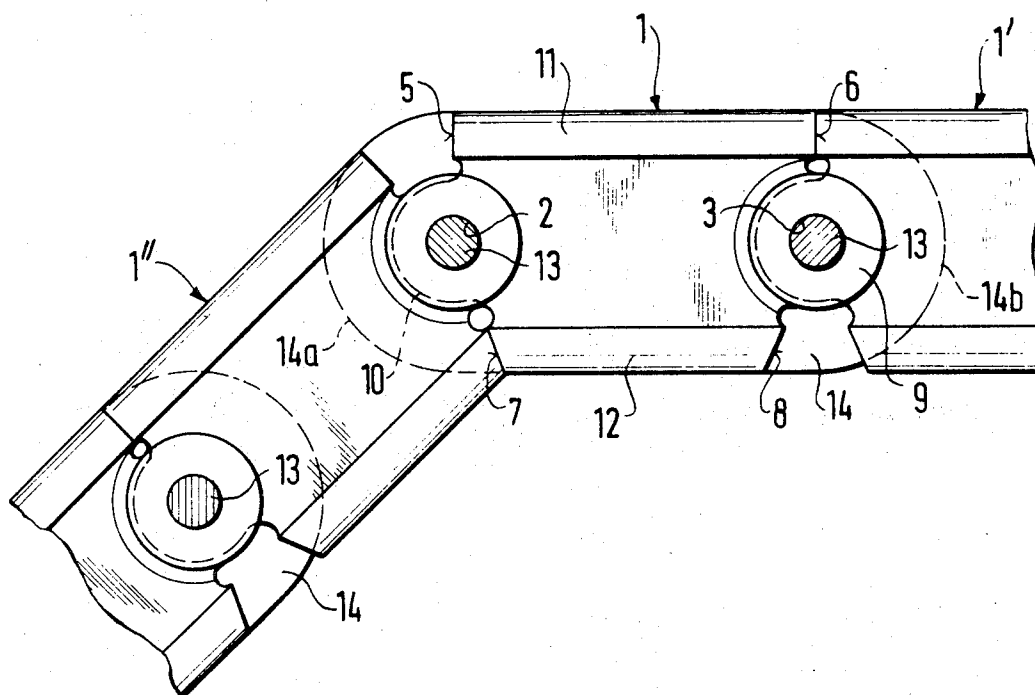


Fig. 1

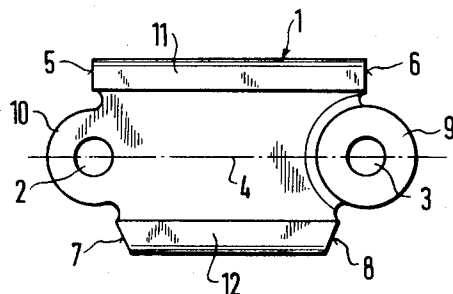


Fig. 2

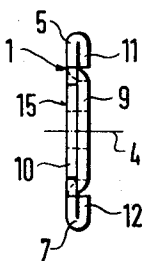


Fig. 3

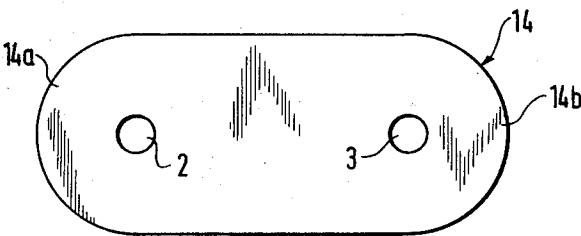
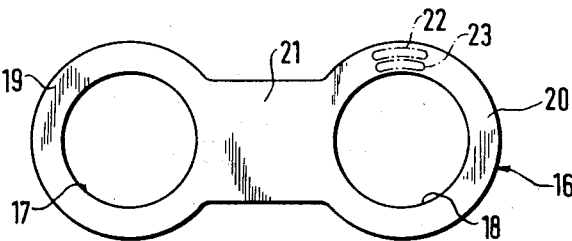


Fig. 4

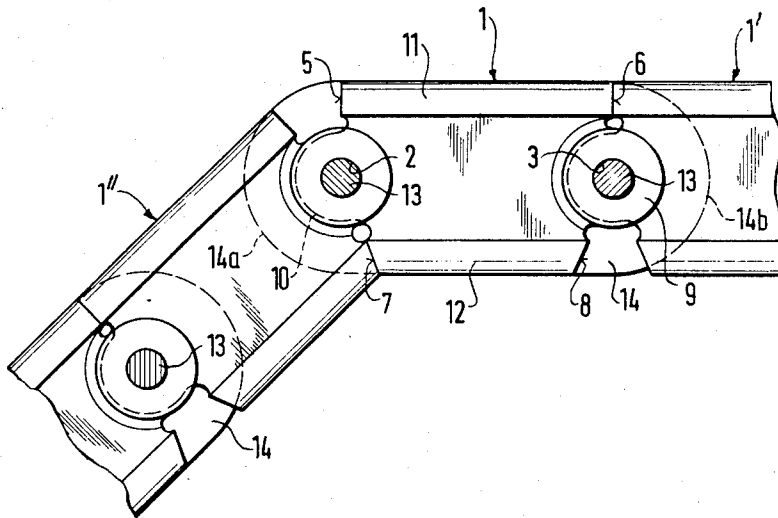


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Fig. 5



SELF-SUPPORTING ARTICULATED CHAIN

This invention relates to a self-supporting articulated chain composed of identical links pivotally connected together, and which on one side of their longitudinal center plane running through the pivot axes have two abutment edges lying parallel to each other and determining the extended position of the chain, and on the other side of the longitudinal center plane have two abutment edges extending obliquely to each other and determining the maximum angled position of the chain.

In a known articulated chain of the type to which the invention relates the individual links are open at their ends. There is consequently a relatively wide externally open gap between the abutment edges which are not quite in contact, and with the constant opening and closing of the gap during movement of the articulated chain there is a considerable risk of accident.

To avoid this disadvantage it has been proposed to close the gap by resilient cover sheets disposed at the outside of the links. However, not only does this method involve considerable manufacturing expense, but it also lacks the desired reliability of operation.

An articulated chain also is known whose individual chain links are each formed of two strap-like plates which in the vicinity of one end are cranked or displaced so far outwards to form a pivot bearing position that the following link can engage between the cranked strap portions. In this case the extended position and the maximum angled position of the chain links are determined by bolts which abut the edges of gate-like recesses. A disadvantage of this construction is the relatively high manufacturing cost. The smallness of the abutment surfaces also produces high surface stresses and hence heavy wear.

The object of the present invention is to avoid the defects of known constructions in producing a self-supporting articulated chain of high rigidity, wherein no open gaps which affect operating reliability are present in the area between adjacent links, which is also marked by a particularly simple construction and ready adaptation of differing radii of curvature, and wherein the stresses occurring in operation are so distributed that little wear is caused.

According to the invention this object is achieved in that one end portion, forming a joint position, of each chain link is cranked or displaced transversely by the amount of the wall thickness, and in that each pair of successive joint positions, including the gap between adjacent chain links, are covered by at least one common covering element lying against one broad side of the chain links.

The displacement of the one joint position in each chain link means that the main parts of the surface of successive chain links lie in one and the same plane. This produces a direct and undeviated direction to the flow of forces, contributing considerably to a stable and robust design.

The displacement of the one joint position by the amount of the wall thickness also ensures that the one broad side of successive chain links form a single plane, so that the covering element provided at this broad side in accordance with the invention can lie closely against the gap between successive chain links. The articulated chain provided by the invention is therefore marked by high security against accidents.

Further details of the invention relate inter alia to the use of a covering element which lies against the other

broad side of the chain links and which in the area of the two pivot bearing positions is preferably cut out in spectacle fashion.

One embodiment of the invention is shown in the drawings. In these:

FIGS. 1 and 2 are a side view and an end view, respectively, of a chain link;

FIGS. 3 and 4 are side views of the two covering elements; and

FIG. 5 is a side view of the articulated chain in accordance with the invention, with the covering element of FIG. 4 removed on the side of the viewer to aid understanding.

The self-supporting articulated chain in accordance with the invention consists of identical links 1, 1', 1'' pivotally connected together, each link having a body through which passes a longitudinal center plane 4 running through the pivot axes 2, 3. On one side of the plane 4 the body terminates in two abutment edges 5, 6 lying parallel to each other, and on the other side of the longitudinal center plane 4 the body terminates in two abutment edges 7, 8 extending obliquely to each other along lines which diverge in a direction toward the plane 4. The parallel abutment edges 5, 6 determine extended position of the chain and the obliquely disposed abutment edges 7, 8 determine the maximum angled position of successive chain links.

As is best shown in FIGS. 1 and 2, the end portion 9 of the chain link 1 which forms one joint portion (pivot axis 3) is displaced laterally by the amount of the wall thickness of the link body. The portion 10 of the adjacent chain link which forms the other joint portion (axis 2) lies in the depression caused by the displacement.

Along their two longitudinal edges 11 and 12 the chain links are reversely bent to form zones of double wall thickness. The abutment edges 5, 6, 7, 8 are thus given a double thickness.

The pivot joint between successive chain links is formed by bolts 13. A plate-like covering element 14 is affixed to alternate links by means of two successive joint bolts 13, each element lying against the flat broad side 15 of the associated link and extending beyond the ends thereof to provide an external cover for two successive joint portions, including the gap between the abutment surfaces of successive chain links. The ends 14a, 14b of the plate-like covering element have the shape of a circular arc.

According to the invention the opposite broad side of the alternate chain links can be provided with a further, spectacle shaped covering element 16 having apertures 17 and 18 at its opposite ends in the area of the two pivot bearing positions 9, 10. In view of the bent longitudinal edges 11, 12 of the chain links, the end areas 19, 20 of the covering element 16 lying on these longitudinal edges are preferably displaced transversely by the amount of the wall thickness. The covering element 16 preferably engages and is suitably attached to the chain link 1 in the area of the central part 21 of the covering element.

In the area of the gap between the abutment edges 5, 6, 7, 8 of adjacent chain links, the covering element 16 can have apertures 22, 23 and/or pocket-shaped elevations which facilitate the emergence of dirt and foreign materials from the gaps.

By using intermediate webs a self-supporting articulated chain system can be constructed from two articu-

lated chains of the type described. Such a system is particularly suitable for holding power cables taken from a fixed connector plug to a movable consumer unit.

I claim:

1. A self-supporting articulated chain composed of a plurality of identical links; means pivotally connecting said links to one another, each of said links having a body member terminating at its opposite ends on one side of a longitudinal center plane running through the pivot axes in first abutment edges substantially parallel to each other and on the other side of said plane in second abutment edges extending obliquely to each other, one end of said body member being displaced to one side thereof by an amount corresponding to the thickness of said body member; and a cover member at one side of alternate ones of said links and extending beyond both ends of the latter to cover the pivotal connection between adjacent links.

2. A chain according to claim 1 wherein each of said cover members is mounted alongside its associated link by said pivotal means.

3. A chain according to claim 1 including a further cover member at the opposite side of said alternate

links and having a length corresponding substantially to the length of the first mentioned cover member, the opposite ends of said further cover member being apertured and accommodating the displaced ends of successive links.

4. A chain according to claim 3 wherein the ends of said further cover member are displaced transversely an amount corresponding to the displacement of said one end of each of said body members.

5. A chain according to claim 3 wherein at least one end of said further member includes means for enabling dirt or the like to pass through said further cover member.

6. A chain according to claim 1 wherein the longitudinal edges of each of said links are bent to double wall thickness.

7. A chain according to claim 1 wherein the ends of said cover member are formed on circular arcs.

8. A chain according to claim 1 wherein the second abutment edges diverge in a direction toward said plane.

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