Dec. 8, 1942. W. HOBBS, JR 2,304,306

SLING

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Fig. 1.

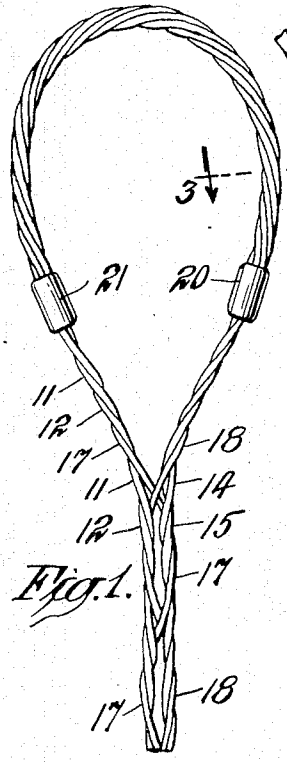


Fig. 2.

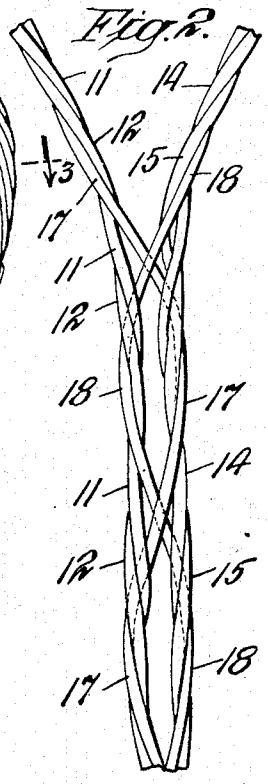
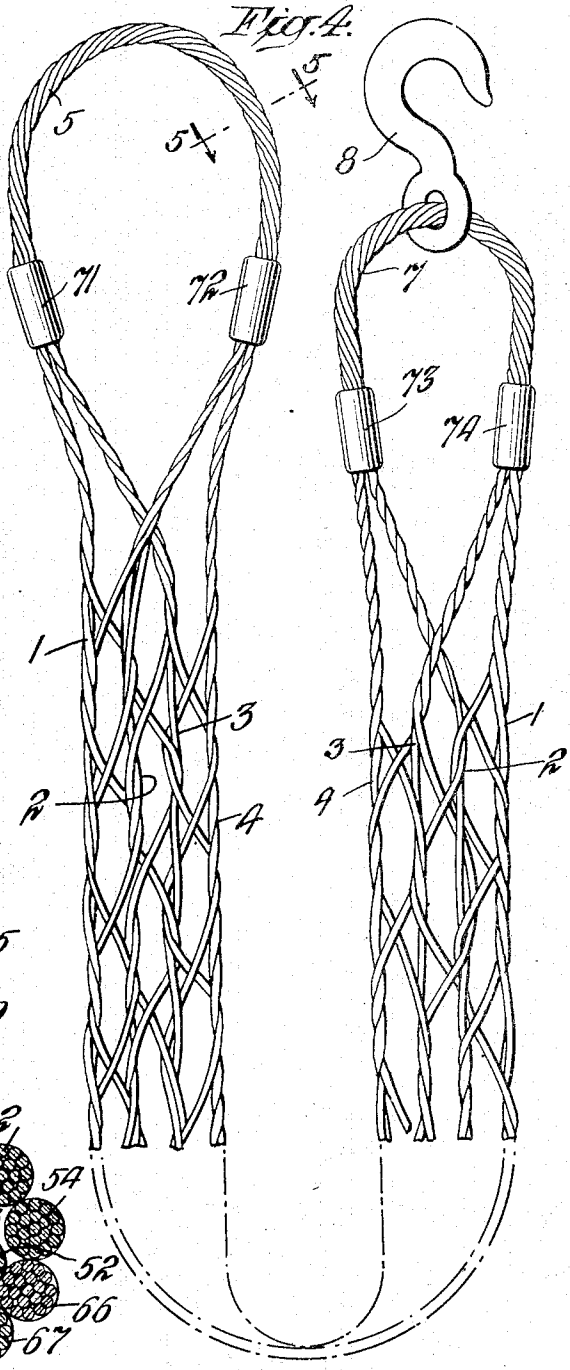


Fig. 4.



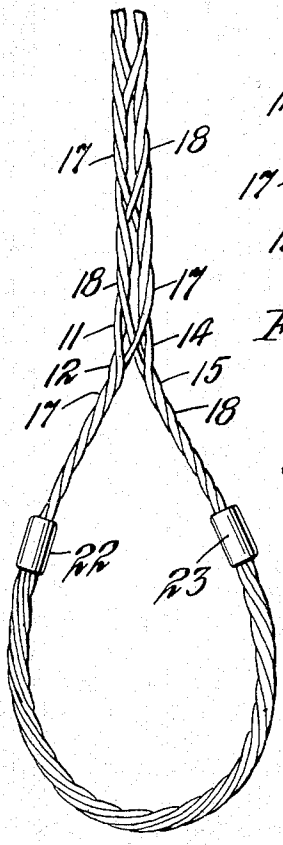


Fig. 3.

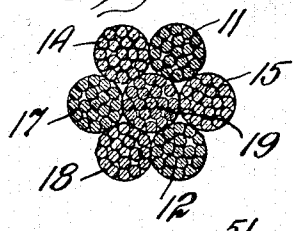


Fig. 5.

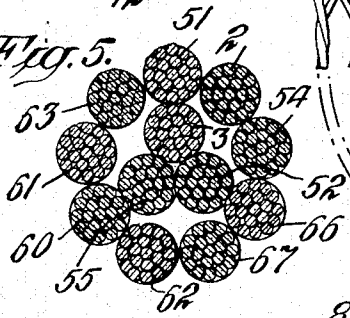
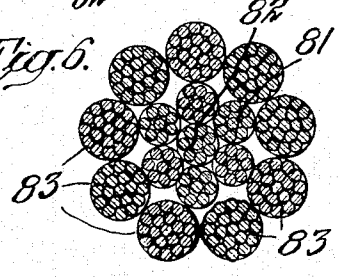


Fig. 6.



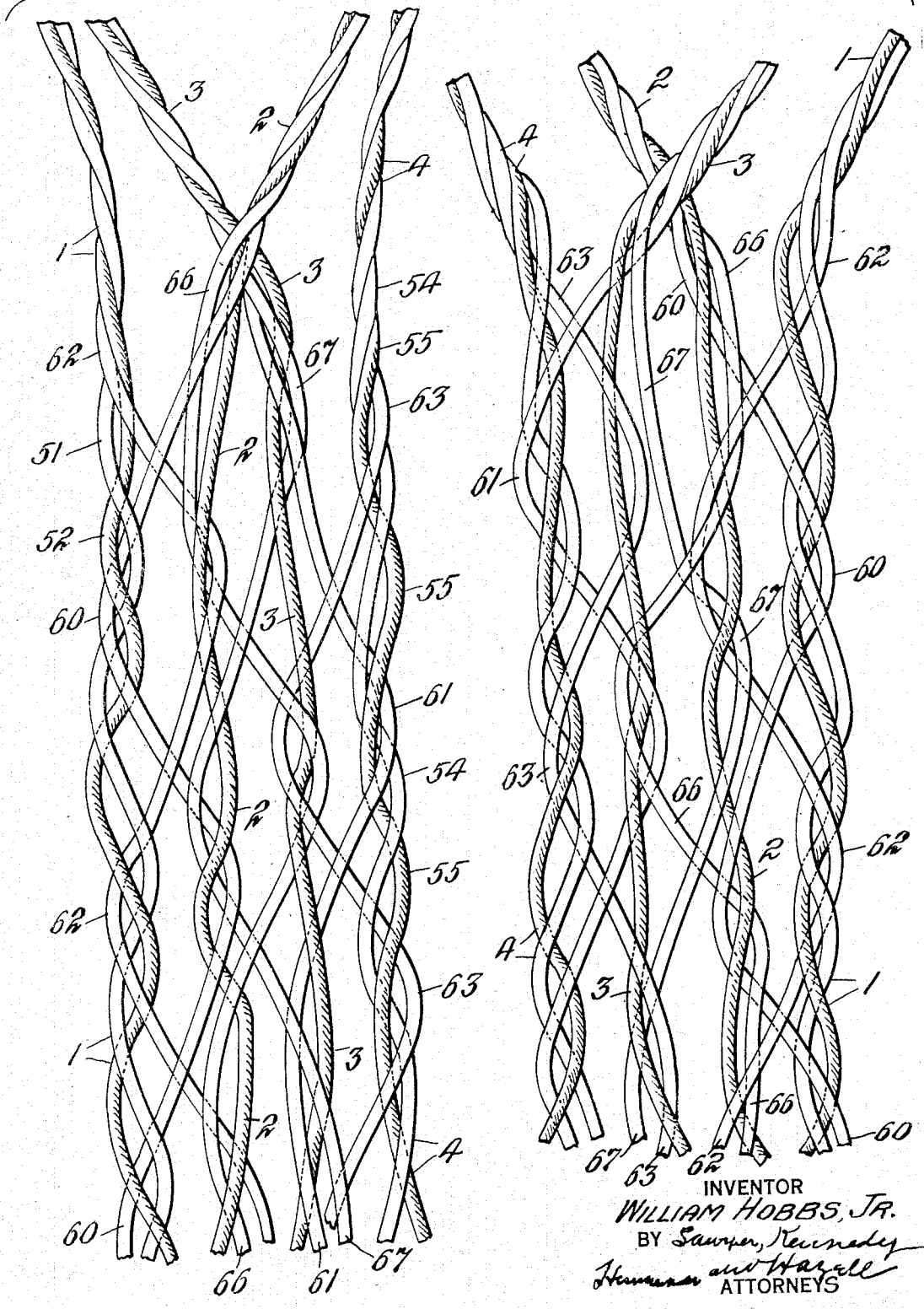
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Fig. 7.



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SLING

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Application January 10, 1942, Serial No. 426,311

9 Claims. (Cl. 294—74)

This invention relates to rope slings, especially wire rope slings.

Among the objects of the invention are to provide a rope sling of novel construction and including modified Flemish eyes, the sling being exceptionally flexible, non-kinking and long wearing and including an eye construction having advantages of strength and ease of sling assembly.

The invention comprises the series of rope groups and tie wires and their association with each other at the ends of the sling to form the eyes, as hereinafter described and claimed.

In the drawings:

Figure 1 is a plan view of one form of sling embodying the invention, partly broken away between the ends and showing the eye construction at each end;

Figure 2 is an enlarged fragmentary view of part of Figure 1 including the sling throat;

Figure 3 is an enlarged sectional view taken on line 3—3 of Figure 1;

Figure 4 is a view of another sling arrangement according to the invention, having a greater number of strand groups than Figure 1 and showing a hook associated with one of the eyes;

Figure 5 is an enlarged diagrammatic view through one of the eyes of Figure 4, taken on the line 5—5 thereof;

Figure 6 is a view similar to Figures 3 and 5 but showing a different number of sling strands and their arrangement in an eye portion; and

Figure 7 is an enlarged fragmentary view of the sling construction of Figure 4 showing especially the arrangement of the group strands and the tie wire strands in the sling body and at the two throats.

It will be understood that the strand groups and the strands themselves in all the figures are shown separated more or less for purposes of illustration.

Referring in detail to the accompanying drawings, and especially to Figures 1, 2 and 3, the sling here shown comprises two distinct and separate strand groups, each of which is associated with the other by means of a pair of tie wires or strands. As viewed in Figures 1 and 2 the left hand strand group is composed of the pair of wires or strands 11 and 12, and the right hand rope group is composed of the pair of wires or strands 14 and 15. As shown in the drawings, each of these groups, i. e., the group composed of strands 11 and 12 and the group composed of strands 14 and 15, continues its own identity and extends longitudinally throughout the body of the sling to and into the throat portions.

These two strand groups are associated with each other by tie wires or strands. In the present example of the invention there are two strand groups, each group composed of two strands, and there are two tie wires or strands 17 and 18. At the throats, as here shown, the tie wire or strand 17 is associated with the strands 11 and 12 forming one group, and the tie wire or strand 18 is associated with the strands 14 and 15 forming the other group. Between the throats, throughout the length of the sling, each tie wire passes from one group across to the other, and in the arrangement shown, over, around and under it, and up between the groups to, over, around and under the first group. This arrangement continues throughout the sling body from one throat to the other, and is such that the two tie wires or strands cross each other repeatedly between the rope groups as each passes from one group to the other. The strands of the two groups are shown as twisted differently in the sling body, one group being right lay and the other left lay, this being usual to avoid the tendency to rotation, but this is not essential and may be varied.

Referring now to the eye construction shown in Figures 1 and 3, the two throat portions leading up to and forming each eye, are each composed of one rope group and one tie wire or strand. Thus, in the throat shown in Figures 1 and 2, one throat portion comprises the rope group consisting of the group strands 11 and 12 and the tie wire 17, and the other throat portion consists of the other group strands 14 and 15 and the other tie wire or strand 18.

The eye loop at each end of the sling includes all the group strands and both tie wires. In this embodiment of the invention, an independent piece of strand 19 is used as a center, as shown in Figure 3. This center strand is used only in the eye loop portion, throughout which it extends from rope button 20 to rope button 21.

In the arrangement shown, the rope group strands 14 and 15 and tie wire strand 18 are twisted right hand, and the rope group strands 11 and 12 and tie wire strand 17 are twisted left hand. In forming the eye one strand, for example 14, is laid around the center strand (Figure 3) from button 20 to button 21; then the opposite side strand 11 is laid next to it from button 21 to button 20. This process is continued so that the strands are laid alternately around the loop center strand first from one side and then the other. This is the preferred arrangement but may be varied. Thus under each of buttons 20 and 21 there are three sling strand

ends and one eye center strand end. Specifically, under button 20 are ends of group strands 11 and 12, tie wire strand 17, and the eye center strand of Figure 3; and under button 21 are the ends of group strands 14 and 15, tie wire strand 18 and the other end of the eye center strand of Figure 3.

At the other end of the sling, the construction is preferably the same, as in the construction shown. It will be understood, however, that the invention includes a sling having this eye construction at only one end, the other end of the rope body being formed or provided with an eye or in any other suitable manner but preferably the sling has suitable eyes at both ends.

It will be seen that, as shown, group strands 11 and 12 and the tie strand 17 extend from the upper eye button 20 of Figure 1 around the loop of the eye, through upper eye button 21, down the length of the sling, through lower eye button 22, and around the loop of the lower eye, ending within lower eye button 23. The group strands 14 and 15 and the tie strand 18 extend from within upper eye button 21, around the upper eye loop, through button 20, down the length of the sling, through lower eye button 23, and around the loop of the lower eye, ending within lower eye button 22.

The sling shown in Figures 1 to 3 has only two strand groups and this is preferred, where the strength required can be secured with strands of the desired flexibility. The number of its end groups in the group may be increased, however, to secure any strength required with the desired flexibility.

Referring to Figures 4, 5 and 7, the sling here shown embodies the same broad invention as the sling of Figure 1, but differs from it in two principal respects, one being that it shows four strand groups instead of two, and the other being that the eye loops are composed only of the strands used in the sling body without any extra center strand or wire in the eye loops.

The sling of Figure 4 is composed of two outside strand groups 1 and 4, and two inside groups 2 and 3, all extending longitudinally from end to end of the sling body. The sling of Figure 4 has a large eye 5 and a smaller eye 7, the latter being shown as provided with a hook 8. Any other suitable fitting may readily be threaded on one or both eyes.

Outside strand group 1 is composed of the pair of twisted strands 51 and 52; outside strand group 4 is composed of the pair of twisted strands 54 and 55. Inside strand groups 2 and 3 are, in the structure of Figures 4 and 7, composed of the single strands as shown.

Throughout the main body of the sling, between the two throats at the ends, tie wires or strands join the strand groups together. As shown in the left hand portion of Figure 7, tie strand 60 passes over strand group 2, between group 2 and group 1, under, around and over group 1, thence between groups 1 and 2, under, around and over group 2, thence between the two groups as before, so continuing throughout the length of the sling body to the other throat.

Similarly, tie strand 61 passes over strand group 3, between group 3 and group 4, under, around and over group 4, thence between groups 3 and 4, under, around and over group 3, thence between the two groups as before, so continuing throughout the length of the sling body to the other throat.

Tie strand 62, associated with strand group 1 at the throat, passes over strand group 1, crosses tie strand 60 between groups 1 and 2, passes under, around and over strand group 2, thence crosses tie strand 60 between the groups as before, passes under, around and over strand group 1 and so continues throughout the length of the sling body to the other throat.

Tie strand 63, associated with strand group 4 at the throat, passes over strand group 4, between strand groups 3 and 4, under, around and over strand group 3, between strand groups 3 and 4 again, under, around and over strand group 4 and so on to the other throat of the sling.

Referring now to the tie strands associating strand groups 2 and 3 with each other, tie strand 66, associated with strand group 2 at the top, passes under strand group 2, thence between strand groups 2 and 3, over, around, and under group 3, thence between groups 2 and 3, over, around and under group 2, and so on to the other throat.

Tie strand 67, associated with group 3 at the throat, passes under group 3, thence crossing tie strand 66 between strand groups 3 and 2, over, around and under strand group 2, thence crossing tie strand 66 again between the two groups, and so on to the other throat.

At the other throat, shown at the right hand side of Figure 7, the tie strands are associated again with the groups with which they started, but this is not essential.

Referring now to the eye loops of Figure 4, their structure is shown in cross section in Figure 5. Each eye loop contains all the strands forming the sling body, the tie strands as well as the strand groups.

At the throat of eye loop 5, tie strand 62 is associated with strand group 1, tie strands 61 and 67 are associated with group 3, and all enter the eye loop button 71. Similarly, tie strand 63 is associated with group 4, tie strands 60 and 66 are associated with group 2, and all enter the eye loop button 72.

The arrangement of all the strands in the sling in the eye loop portions may be as shown in Figure 5. As here shown, the structure is such as to form a central core of three of the strands, each of which is preferably associated with a different group at the throat. As illustrated, the strands 3, 52 and 55 compose the central core, and around this core are twisted the remaining strands in the order, for example, shown in Figure 5.

From this it will be seen that the group 1 strands 51 and 52, group strand 3, tie strand 62 and tie strands 61 and 67 all have ends within eye loop button 72, and all pass around loop 5, through eye loop button 71, thence down the sling throughout its length as described, into and through eye loop button 74 and around the eye loop 7, and have their ends in eye loop button 73.

Similarly, group 4 strands 54 and 55, group strand 2, tie strand 63 and tie strands 60 and 66 have ends within eye loop button 71 of eye loop 5, pass around eye loop 5 into and through eye loop button 72, thence down the sling as described, into and through eye loop button 73 of eye loop 7, around eye loop 7 and have their ends in eye loop button 74.

As the strand twists were described in connection with Figure 1, the strands of the sling of Figure 4 entering eye buttons 72 and 73 are twisted right hand, and the strands entering eye buttons 71 and 74 are twisted left hand.

From the foregoing, and especially from Figures 3 and 5, it will be apparent that the arrange-

ment of strands in the eye loops may be varied while still using all of the sling strands in each eye loop as described. It is also evident that the invention is not limited to the particular number of sling strand groups or the number of strands in each sling strand group extending throughout the sling body, although the arrangement shown of two twisted strands in each group is preferred.

For example, there may be three strand groups, each group of two strands with a separate eye center as shown in the eye loop cross section of Figure 6. As shown in this figure a six strand rope center formed of strands 81 with its own core 82 may be used from one button to the other in each eye loop, and around the six strand center may be twisted all the nine sling strands 83, which may be combined in the sling body in substantially the same manner as in Figure 7 one of the inside strand groups being omitted.

It will be understood that, in this example, four strands from the sling body enter one eye loop button of an eye and the remaining five strands enter the other button of that eye.

What is claimed is:

1. A sling including a series of twisted sling strand groups extending longitudinally throughout the sling body, tie strands tying each strand group to each adjacent strand group and extending from each strand group to and around each adjacent strand group and back again throughout the sling body, said sling having an eye structure including two throat portions and a loop portion, all of the strands of the sling being included in one or the other of the two throat portions of the eye, and the loop portion of the eye including all of the strands of the sling, the strands in each throat portion of the eye extending around the loop thereof to the other throat portion and a button at each end of the loop enclosing the ends of the strands from the opposite throat portion.

2. A sling including a series of twisted strand groups extending longitudinally throughout the sling body, tie strands tying each strand group to each adjacent strand group and extending from each strand group to and around each adjacent strand group and back again throughout the sling body, said sling having an eye structure including two throat portions and a loop portion, one of the throat portions having its strands twisted right hand the other left hand, all of the strands of the sling being included in one throat portion or the other, and all the strands in the two eye throat portions being included in the eye loop.

3. A sling including a series of twisted strand groups extending longitudinally throughout the sling body, tie strands tying each strand group to each adjacent strand group and extending from each strand group to and around each adjacent strand group and back again throughout the sling body, said sling having an eye structure comprising a pair of throat portions and an eye loop portion joining them, all the strands of the sling being comprised in one throat portion or the other, all the strands of each throat portion extending throughout the eye loop to the other throat portion, a button at each end of the eye loop enclosing the ends of the strands from its opposite throat portion, and an auxiliary strand center within the eye loop strands extending from one eye loop button to the other and having an end enclosed within each button.

4. A sling including a series of twisted strand groups extending longitudinally throughout the sling body, tie strands tying each strand group to each adjacent strand group and extending from each strand group to and around each adjacent strand group and back again throughout the sling body, said sling having an eye structure including all the group strands and all the tie strands of the sling, some of the sling strands composing the eye lying within the others and forming an eye loop center.

5. A rope sling eye having two separate strand groups at the base of the eye with the strands of the groups layed up together to form the eye and a button on each group enclosing the strands of one group at the base of the eye and the ends of the strands of the other group.

6. A rope sling eye having two separate strand groups at the base of the eye with the strands of the groups layed up together to form the eye on a center other than the group strands and a button on each group enclosing the strands of one group at the base of the eye and the ends of the strands of the other group and of the center.

7. A rope sling eye having two separate strand groups at the base of the eye with the strands of the groups layed up together on a center formed by some of the group strands to form the eye and a button on each group enclosing the strands of one group at the base of the eye and the ends of the strands of the other group.

8. A sling including a series of twisted sling strand groups and a series of tie strands, said strand groups extending substantially straight through the sling body, and said tie strands tying each strand group to each adjacent strand group and extending from each strand group to and around each adjacent strand group and back again throughout the sling body, said sling having an eye structure formed from the group strands and tie strands of the sling.

9. A sling including a series of pairs of twisted strands forming sling strand groups extending substantially straight through the sling body, and a series of tie strands tying together the sling strand groups, each to its adjacent sling strand group, said tie strands extending from each strand group to and around each adjacent strand group and back again throughout the sling body, said sling having an eye structure formed from the group strands and tie strands of the sling.

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