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(54) **Truss sleeve**

(57) Truss sleeve, provided for covering a truss of for example a temporary structure on a stage on which various light and audio equipment and the like can be suspended. The truss sleeve comprises a tubular piece of elastic cloth having a predetermined unstretched circumference and a predetermined degree of elasticity,

selected for tightly fitting around at least one common type of truss. The invention further relates to a combination of a truss with a truss sleeve and a method for erecting a temporary structure in which at least one of the trusses is covered by means of a truss sleeve according to the invention.

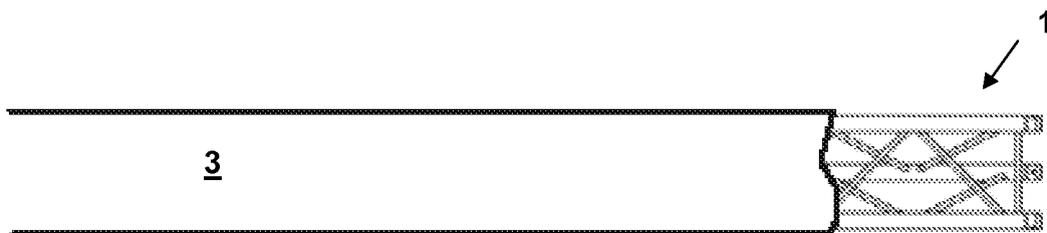


FIG. 5

EP 2 060 705 A1

Description

Technical field

[0001] The present invention relates to a sleeve for a so-called "truss", i.e. a support structure which is used for building temporary structures on stages on which various light and audio equipment and the like can be suspended.

[0002] The invention further relates to the combination of a truss with a truss sleeve and a method for building a temporary structure for suspending various light and audio equipment above a stage, using the truss sleeve of the invention.

Background art

[0003] Temporary structures for suspending various light and audio equipment above a stage of for example a rock festival are commonly built up using trusses, two common types of which are shown in perspective view in figures 1 and 2 and in cross-section in figures 3 and 4. These trusses are usually made in metals like aluminium or alloys thereof in view of light weight, manoeuvrability and transportability. As a result, the trusses usually have a silvery, shiny grey appearance.

[0004] Many artists or performers dislike the visibility of these trusses as a result of their appearance and desire to have them covered, for example with woven black cloth so that their visibility during the performance is reduced. However, this is a laborious and time consuming operation.

Disclosure of the invention

[0005] It is an aim of the present invention to provide a truss sleeve which can be quickly applied.

[0006] This aim is achieved according to the invention with a truss sleeve showing the technical characteristics of the first claim.

[0007] The truss sleeve of the invention is characterised in that it comprises a tubular piece of elastic cloth having a predetermined unstretched circumference and a predetermined degree of elasticity for tightly fitting around at least one common type of truss.

[0008] As used herein, with unstretched circumference is meant the length of the circumference of the tubular piece of cloth in unstretched state.

[0009] As used herein, with degree of elasticity is meant the extent to which the cloth can be stretched in circumferential direction without tearing or damage. This property is expressed as a percentage which equals the achievable additional length with respect to the original length, e.g. a degree of elasticity of 100% means that the cloth can be stretched up to twice its original length, a degree of elasticity of 150% means that the cloth can be stretched up to two-and-a-half times its original length, etc.

[0010] In preferred embodiments, the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected for enabling the truss sleeve to be used on at least two common types of truss of different circumference. Preferably, the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected for enabling the truss sleeve to be used on trusses within a predetermined range of circumferences, which implies that the unstretched circumference is below the lower boundary of the range and the degree of elasticity is such that the cloth can be stretched to a circumference above the upper boundary of the range.

[0011] In a first preferred embodiment the properties of the truss sleeve are selected for enabling its use on trusses with circumferences ranging from about 90 cm to about 120 cm. Suitable properties are for example an unstretched circumference of 50-60 cm and a degree of elasticity of 100-160%. An example of such an embodiment is a truss sleeve with an unstretched circumference of about 56 cm which is stretchable up to 130 cm, so has a degree of elasticity of about 132%.

[0012] In a second preferred embodiment the properties of the truss sleeve are selected for enabling its use on trusses with circumferences ranging from about 120 cm to about 160 cm. Suitable properties are for example an unstretched circumference of 70-80 cm and a degree of elasticity of 100-160%. An example of such an embodiment is a truss sleeve with unstretched circumference of about 76 cm which is stretchable up to 170 cm, so has a degree of elasticity of about 124%.

[0013] In all embodiments, preferably the properties of the cloth are furthermore selected such that, while in use around a truss for which it is intended, the truss sleeve can be further stretched to a small extent for enabling clamps of light or audio equipment to be fixed to the covered bars of the truss. In this way, it can be avoided that the user would have to cut parts from the truss sleeve to enable the fixing of these clamps or would damage the truss sleeve by the fixing of these clamps. With the cloth used in the prior art, such would be unavoidable.

[0014] In the above embodiments, the tubular piece of cloth is preferably made by knitting, since this can easily ensure that the predetermined degree of elasticity is achieved. Preferably, the technique of circular knitting is used for manufacturing the truss sleeve of the invention, which avoids a seam. Knitting and circular knitting are techniques which are well known in the textile industry and therefore need no further explanation here. Use of these techniques additionally has the advantage that the tubular piece of cloth can be made in virtually unlimited lengths and can be supplied on rolls, of which the user can simply cut the desired length.

[0015] Preferably the truss sleeve is made in a fire-retardant material, such as for example yarn composed of or at least containing polyester fibres. Use of such a material also has the advantage that the truss sleeve is washable and reusable. Alternatively, other materials

such as for example cotton with a permanent fire-retardant coating could also be used.

[0016] The truss sleeve of the invention is preferably black but may also have any other desired colour. The colour of the cloth may be a property of the used material itself or may be achieved by dyeing the yarn or the finished textile.

Brief description of the drawings

[0017] The invention will be further elucidated by means of the following description and the appended figures.

Figure 1 shows a perspective view of a first common type of truss for which the truss sleeve of the invention is intended.

Figure 2 shows a perspective view of a second common type of truss for which the truss sleeve of the invention is intended.

Figure 3 shows a cross-section of the truss of figure 1.

Figure 4 shows a cross-section of the truss of figure 2.

Figure 5 shows a side view of the combination of a truss and a truss sleeve according to the invention.

Figure 6 shows a cross-section of the combination of a truss and a truss sleeve according to the invention, on which a clamp for additional equipment is fixed.

Modes for carrying out the invention

[0018] The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto but only by the claims. The drawings described are only schematic and are non-limiting. In the drawings, the size of some of the elements may be exaggerated and not drawn on scale for illustrative purposes. The dimensions and the relative dimensions do not necessarily correspond to actual reductions to practice of the invention.

[0019] Furthermore, the terms first, second, third and the like in the description and in the claims, are used for distinguishing between similar elements and not necessarily for describing a sequential or chronological order. The terms are interchangeable under appropriate circumstances and the embodiments of the invention can operate in other sequences than described or illustrated herein.

[0020] Moreover, the terms top, bottom, over, under and the like in the description and the claims are used for descriptive purposes and not necessarily for describing relative positions. The terms so used are interchangeable under appropriate circumstances and the embodiments of the invention described herein can operate in other orientations than described or illustrated herein.

[0021] The term "comprising", used in the claims,

should not be interpreted as being restricted to the means listed thereafter; it does not exclude other elements or steps. It needs to be interpreted as specifying the presence of the stated features, integers, steps or components as referred to, but does not preclude the presence or addition of one or more other features, integers, steps or components, or groups thereof. Thus, the scope of the expression "a device comprising means A and B" should not be limited to devices consisting only of components A and B. It means that with respect to the present invention, the only relevant components of the device are A and B.

[0022] Embodiments of the truss sleeve of the invention are shown in figures 5 and 6. In general, the truss sleeves of the invention are intended for use on trusses of the types shown in figures 1 and 3 and in figures 2 and 4. The first type shown in figures 1 and 3 is a triangular truss 1, composed of three longitudinal bars at the corners of a triangle and multiple interconnecting bars. The second type shown in figures 2 and 4 is a square truss 2, composed of four longitudinal bars at the corners of a square and multiple interconnecting bars. It is evident that truss sleeves may be designed according to the invention for covering any other known or as yet unknown type of truss in this field, for example trusses with any other number of longitudinal bars and any other polygonal shape in cross-section.

[0023] The first type of truss 1 commonly has either a side length L_t of about 30 cm or about 40 cm. The second type of truss 2 also commonly has either a side length L_s of about 30 cm or about 40 cm. Preferred embodiments of the truss sleeve of the invention are designed for covering these trusses in these dimensions, but it is evident that truss sleeves may be designed according to the invention for covering trusses of any other dimensions.

[0024] The bars of these trusses 1, 2 are commonly made in a metal, such as for example aluminium or an alloy thereof, although other materials would also be possible. As a result of the use of aluminium, they have a silvery, shiny grey appearance, which is often disliked and explains the need for providing a suitable cover for these trusses.

[0025] Figure 5 shows a truss sleeve 3 according to the invention, applied on a triangular truss 1. The truss sleeve 3 comprises a tubular piece of elastic cloth having a predetermined unstretched circumference and a predetermined degree of elasticity, selected such that it tightly fits around the truss 1. Preferably, these properties are furthermore selected such that the truss sleeve 3 is also usable on a truss of different dimensions. Sufficient elasticity can for example be achieved by using a knitting technique for manufacturing the truss sleeve 3, since this can lead to a degree of elasticity of 100% or more. For example, a circular knit truss sleeve with an unstretched circumference of about 56 cm can be used on trusses having a circumference ranging from about 90 cm to about 120 cm, i.e. for example a triangular truss with side

length L_t of 30 cm, a triangular truss with side length L_t of 40 cm as well as a square truss with side length L_s of 30 cm. Another example is a circular knit truss sleeve with an unstretched circumference of 76 cm, which can be used on trusses having a circumference ranging from about 120 cm to about 160 cm, i.e. for example a triangular truss with side length L_t of 40 cm, a square truss with side length L_s of 30 cm as well as a square truss with side length L_s of 40 cm.

[0026] Figure 6 shows a truss sleeve 3 according to the invention, applied on a square truss 2. As shown, a C-clamp 4 of for example light equipment is fixed to one of the bars of the truss without removing the truss sleeve 3 at the fixing location. As a result of fixing the clamp 4, the truss sleeve 3 is stretched somewhat further, which is enabled by suitably selecting the predetermined properties (unstretched circumference and degree of elasticity).

[0027] With the truss sleeve 3 of the invention, temporary structures with trusses 1, 2 can be erected as is common, but the truss sleeve is placed around each truss to be covered (i.e. those trusses for which covering is desired, which will mostly be all of them) before it is connected to other parts of the temporary structure. To this end, the truss sleeve, which is for example supplied on a roll, is cut to fit the length of the respective truss. After the temporary structure has been erected, the clamps 4 additional equipment (light, audio or other equipment) can be fixed to the covered trusses without cutting away the part of the truss sleeve at the fixing location, which is possible as a result of the elasticity of the truss sleeve. As a result, damage to the truss sleeve can be avoided and it can be reused afterwards.

[0028] Preferably, the truss sleeve 3 is made in a fire-retardant material, such as for example polyester which also has the advantage of being washable and so also enables multiple reuse of the truss sleeve 3.

[0029] The truss sleeve 3 is preferably black but may also have any other desired colour. The colour of the cloth may be a property of the used material itself or may be achieved by dyeing the yarn or the finished textile.

[0030] The cloth of the truss sleeve 3 may also be elastic in longitudinal direction, but this is not essential.

Claims

1. Truss sleeve, provided for covering a truss of for example a temporary structure on a stage on which various light and audio equipment and the like can be suspended, **characterised in that** the truss sleeve comprises a tubular piece of elastic cloth having a predetermined unstretched circumference and a predetermined degree of elasticity, selected for tightly fitting around at least one common type of truss.
2. Truss sleeve according to claim 1, **characterised**

in that the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected for enabling the truss sleeve to be used on at least two common types of truss of different circumference.

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3.

Truss sleeve according to claim 1 or 2, **characterised in that** the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected for enabling the truss sleeve to be used on trusses within a predetermined range of circumferences.

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4.

Truss sleeve according to any one of the claims 1-3, **characterised in that** the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected for enabling use on trusses with circumferences ranging from about 90 cm to about 120 cm.

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5.

Truss sleeve according to claim 4, **characterised in that** the unstretched circumference is 50-60 cm and the degree of elasticity is 100-160 %.

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6.

Truss sleeve according to any one of the claims 1-3, **characterised in that** the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected for enabling use on trusses with circumferences ranging from about 120 cm to about 160 cm.

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7.

Truss sleeve according to claim 6, **characterised in that** the unstretched circumference is 70-80 cm and the degree of elasticity is 100-160%.

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8.

Truss sleeve according to any one of the previous claims, **characterised in that** the predetermined unstretched circumference and the predetermined degree of elasticity of the cloth are selected such that, while in use around a truss for which it is intended, the truss sleeve can be further stretched to a small extent.

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9.

Truss sleeve according to any one of the previous claims, **characterised in that** the tubular piece of cloth is made by knitting.

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10.

Truss sleeve according to any one of the previous claims, **characterised in that** the tubular piece of cloth is made by circular knitting.

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11.

Truss sleeve according to any one of the previous claims, **characterised in that** the truss sleeve is made in a fire-retardant material.

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12.

Truss sleeve according to claim 11, **characterised in that** the truss sleeve is made in yarn composed of or at least containing polyester fibres.

13. Truss sleeve according to any one of the previous claims, **characterised in that** the tubular piece of cloth is black.
14. A truss for building a temporary structure on a stage on which for example various light and audio equipment and the like can be suspended, **characterised in that** the truss is covered by a truss sleeve according to any one of the claims 1-13.
15. Method for building a temporary structure on a stage on which for example various light and audio equipment and the like can be suspended, comprising the step of connecting multiple trusses to each other, **characterised in that** the method comprises the step of covering at least one of the trusses by means of a truss sleeve according to any one of the claims 1-13.
16. Method according to claim 15, **characterised in that** the method further comprises the step of fixing additional equipment to one of the covered trusses without cutting away part from truss sleeve.

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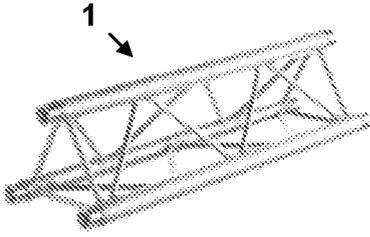


FIG. 1

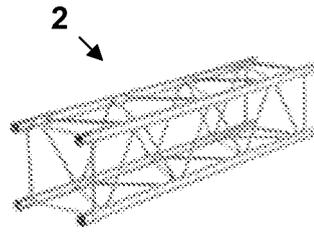


FIG. 2

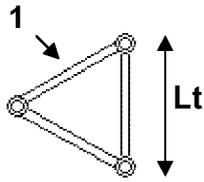


FIG. 3

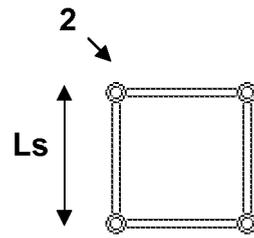


FIG. 4



FIG. 5

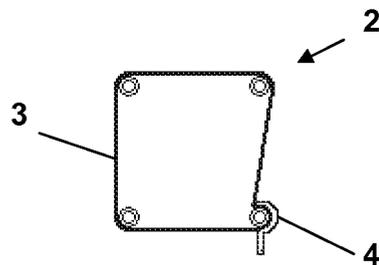


FIG. 6



DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	FR 2 183 424 A (PERRAY MARC [FR]) 14 December 1973 (1973-12-14) * page 2, lines 1-16; figures 1-3 * -----		INV. E04H12/10
A	FR 2 899 263 A (A2S INTERNAT SARL [FR]) 5 October 2007 (2007-10-05) * page 4, lines 20-30; figure 3 * -----		ADD. E04C3/04
			TECHNICAL FIELDS SEARCHED (IPC)
			E04H
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 15 May 2008	Examiner Vratsanou, Violandi
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 07 12 0609

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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15-05-2008

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2183424	A	14-12-1973	NONE	

FR 2899263	A	05-10-2007	NONE	

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82