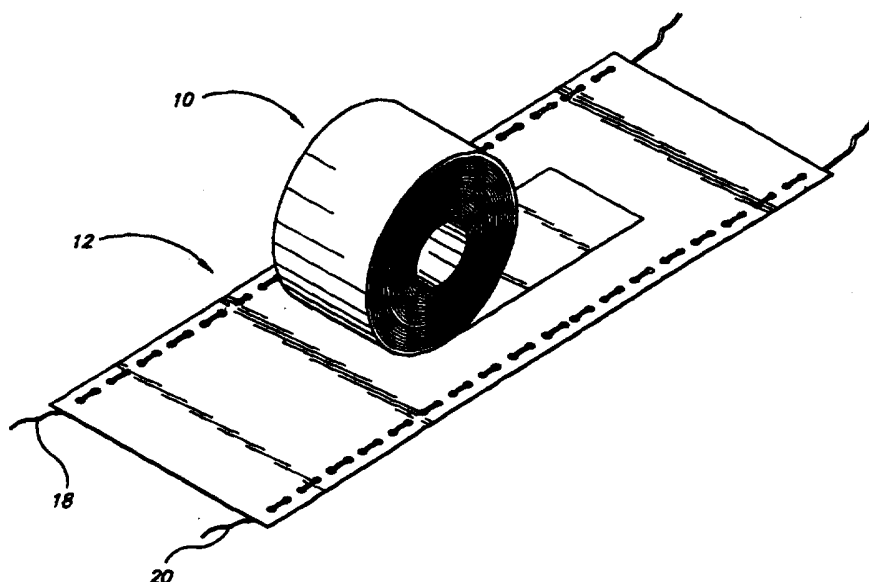




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(21) International Application Number: PCT/US96/16061 (22) International Filing Date: 8 October 1996 (08.10.96) (30) Priority Data: 08/540,457 10 October 1995 (10.10.95) US (71) Applicant: QUINONES, Victor, Manuel [US/US]; 7123 Horizon Peak, San Antonio, TX 78233 (US). (74) Agent: LITMAN, Richard, C.; Litman Law Offices, Ltd., Crystal City Station, P.O. Box 15035, Arlington, VA 22215-0035 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: METHOD AND SYSTEM FOR WRAPPING STEEL**(57) Abstract**

A method for wrapping a roll of steel (10) or other coiled material which includes the selection of a tear-resistant sheet (12) of proportions to accommodate a steel roll (10). The sheet is folded along lines parallel to its width, and holes are punched through the folded sheet at the upper and lower ends of the sheet, forming a plurality of upper holes and a plurality of lower holes. The sheet is unfolded and ropes or strings (18, 20) are threaded through each set of holes. A roll of steel (10) is placed on the sheet (12) and the sheet (12) is wrapped circumferentially around the roll (10) and secured with adhesive tape. The strings (18, 20) are then drawn tightly, pulling the sheet (12) radially over the roll of steel (10) such that the sheet (12) overlaps the aperture of the core of the roll (10).

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METHOD AND SYSTEM FOR WRAPPING STEEL**BACKGROUND OF THE INVENTION**5 **1. FIELD OF THE INVENTION**

The present invention relates to a method and system for wrapping rolled material, particularly a roll of steel.

10

2. DESCRIPTION OF THE PRIOR ART

The present invention relates to a method for wrapping tear-resistant paper or a layer of plastic around a roll of coiled material. The paper is secured around the material by tightening drawstrings threaded through the top and bottom of the paper. Heretofore, methods and systems for wrapping rolled material and cable are slow and do not provide moisture resistance in that they do not completely cover the roll.

20

Following are previously patented inventions which disclose related inventions having the above-noted limitations.

U.S. Patent Nos. 737,328, 744,467, and 746,447, issued to H.C. Boyle et al. on August 25, 1903, November 17, 1903, and on December 8, 1903, respectively, teach tubular covers for wire coils which are tightened over the coil and whose free ends are held together by laces, straps, or buckles.

30

U.S. Patent No. 3,690,087, issued on September 12, 1972 to Arnulv Moe Jacobsen, teaches a method of packaging cable in which two flexible members are attached to a mandrel on which a cable has been wound and attached to each other by rope laced through holes in flaps around the periphery of the flexible members.

35

U.S. Patent No. 4,826,015, issued on May 2, 1989 to Ronald L. Mandel, teaches a material handling

arrangement which includes a set of straps circumferentially wrapping a roll of material and a second set radially wrapped around the material.

5 In addition to lacking many of the benefits of the instant invention, these patents teach methods completely different from that instantly claimed. Thus, none of the above inventions and patents, taken either singly or in combination, is seen to describe the instant invention as claimed.

10 SUMMARY OF THE INVENTION

The invention is directed to a method for wrapping coiled material which includes the selection of a
15 tear-resistant sheet of proportions to accommodate a steel roll. The sheet is folded along lines parallel to its width, and holes are punched through the folded sheet at the upper and lower ends of the sheet, forming a plurality of upper holes and a plurality of
20 lower holes. The sheet is unfolded and ropes or strings are threaded through each set of holes. A roll of coiled material is placed on the sheet and the sheet is wrapped circumferentially around the roll and secured with adhesive tape. The strings are then
25 drawn tightly, pulling the sheet radially over the material such that the sheet overlaps the aperture of the core of the roll. The overlapping portion of the sheet is folded inside of the core and inner diameter protectors are placed in the core to secure the sheet.

30 Accordingly, it is a principal object of the invention to present a method and system for quickly and easily wrapping steel or any other type of coiled material such that labor and the risk of accidents will be reduced.

35 It is another object of the invention to provide a method and system by which a roll of steel is completely covered such that it is protected from moisture.

It is a further object of the invention to provide a method by which the system for wrapping a steel or other type of roll is easily made.

5 It is an object of the invention to provide improved elements and arrangements thereof in an apparatus for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

10 These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

15 Fig. 1 is a perspective view of a roll of steel next to a tear-resistant sheet.

Figure 2 is a perspective view of the tear resistant sheet folded into a plurality of panels.

20 Figure 3 is a perspective view of a the tear-resistant sheet in which a hole has been punched through each of the top and bottom of the sheet.

Figure 4 is a perspective view of the sheet with a string laced through the bottom holes and a string laced through the top holes.

25 Figure 5 is a perspective view of the sheet and the string with a roll of steel on top of the sheet.

Figure 6 is a perspective view of the sheet being rolled circumferentially around the steel.

30 Figure 7 is a perspective view of the sheet being drawn radially along the roll of steel.

Figure 8 is a perspective view of an inside diameter protector being inserted into the core of the steel.

35 Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention relates to a method for wrapping a roll of steel 10 or any other type of coiled material in a tear-resistant sheet 12. A system for wrapping the steel is also presented. As seen in Figure 1, a layer of a tear-resistant sheet 12, which can be made from paper and/or plastic (polyethylene or polypropylene), is provided. The sheet 12 has a length slightly greater than the periphery of the steel roll 10 and a width slightly greater than the sum of the length of the steel roll 10 and the difference between the inside diameter and the outside diameter of the steel roll 10.

By way of example, a steel roll that is 36 inches long, has an inside diameter of 20 inches, and an outside diameter of 60 inches, requires a sheet that is approximately 84 inches wide and 17 feet long. The length of the sheet, which is wrapped circumferentially along the steel roll, is calculated based on the periphery of the roll, πd . The width of the sheet, which is wrapped radially along the steel roll, is calculated based on the length of the cylinder plus the difference between the outside and inside diameters of the roll, i.e. $L+OD-ID$. Margins for overlap are allowed in the dimensions of the sheet by making the dimensions of the sheet slightly greater than the values calculated in the above relationships. Preferably, these calculated amounts are increased by approximately ten percent to allow for overlap. The importance of this overlap, particularly of the width of the sheet, will become apparent upon further description of the invention.

Figure 2 shows the sheet 10 folded along lines parallel to its width into a plurality of panels. Although the length of the panels is not critical, by way of example, the sheet may be folded into 34 panels

such that each panel maintains its width of 84 inches and is 6 inches long. As seen in Figure 3, a hole 14 is punched through the upper portion of the panels, and a hole 16 is punched through the lower section of the panels. In keeping with the example immediately above, the upper holes are 6 inches apart and the lower holes are 6 inches apart. It is noted that this distance can be changed based on the way in which the sheet 12 is folded.

Figure 4 shows a string or rope 18 threaded through the upper holes and a string or rope 20 threaded through the lower holes. The sheet 12 is then straightened out and the roll of steel 10 is placed on the sheet and centered with respect to the length and width of the sheet (as seen in Figure 5).

Figure 6 shows that sheet 12 is wrapped circumferentially around the periphery of the roll of steel 10 and secured with a piece of adhesive tape 22. The string or rope 20 which runs through the lower holes is pulled tightly, causing the sheet 12 to radially cover the steel roll 10. As seen in Figure 7, the sheet 12 overlaps the interior diameter of the steel roll 10. As shown in Figure 8, this overlapping material is folded into the core of the steel roll 10 and secured against the steel roll by an inside diameter protector 24, which fits snugly into the steel roll. The steps of Figures 7 and 8 are then repeated for the other side of the steel roll, i.e. rope or string 18 is pulled tightly and an inside diameter protector is used on the other side of the steel roll.

It is to be understood that the present invention is not limited to the sole embodiment described above, but encompasses any and all embodiments within the scope of the following claims.

CLAIMS

1. A method of wrapping a cylindrical roll of coiled material comprising:

placing the cylindrical roll completely on a sheet, said sheet having a string or rope running through each of its upper and lower portions,

wrapping the left and right ends of the sheet circumferentially around the periphery of the roll,

pulling the string or rope towards the center of the coiled material, such that the sheet radially comes together to cover the coiled material and to form a circular aperture of smaller diameter than the inside diameter of the roll and overlaps the aperture in the coiled material, and

placing an inside diameter protector inside the inner diameter of the coiled material and forcing the sheet overlapping the coiled material against the inner periphery of the coiled material.

2. The method of claim 1 further comprising the step of providing a sheet of specific dimensions.

3. The method of claim 1 further comprising providing a sheet having a width slightly greater than the sum of the length of the coiled material and the difference between the inside diameter of the coiled material and the outside diameter of the coiled material, and having a length slightly greater than the periphery of the coiled material.

4. The method of claim 3 further comprising the step of measuring the length, inside diameter, and outside diameter of the coiled material and calculating the size of the sheet required to accommodate the roll.

5. The method of claim 1 further comprising the step of measuring the length, inside diameter, and outside diameter of the coiled material and calculating the size of the sheet required to accommodate the roll.

6. The method of claim 1 further comprising preparing the sheet for wrapping the coiled material.

7. The method of claim 1 further comprising the steps of:

folding the sheet along its width a plurality of times so that a plurality of panels are formed,

punching a hole through the top and through the bottom of the plurality of panels such that a top hole and a bottom hole, the holes being symmetrically disposed to those in other panels, are made in each panel, and

threading a string or rope through the top holes in each panel and threading a string or rope through the bottom holes in each panel, such that the strings or ropes run along the length of the sheet at the top and the bottom of the sheet.

8. A method of wrapping a cylindrical roll of steel having an inside diameter, an outside diameter and a length, comprising:

providing a rectangular sheet of a tear-resistant material having a width slightly greater than the sum of the length of the steel roll and the difference between the inside diameter of the steel roll and the outside diameter of the steel roll, and having a length slightly greater than the periphery of the steel roll, the extreme ends of the sheet across the width being defined as top and bottom portions and the extreme ends across the length being defined as left and right,

folding the sheet along its width a plurality of times so that a plurality of panels are formed,

punching a hole through the top and through the bottom of the plurality of panels such that a top hole and a bottom hole, the holes being symmetrically disposed to those in other panels, are made in each panel,

threading a string or rope through the top hole in each panel and threading a string or rope through the bottom hole in each panel, such that the strings or ropes run along the length of the sheet at the top and the bottom of the sheet,

placing the cylindrical roll completely on the sheet such that the length of the roll is across the width of the sheet and the roll is in the center of the sheet with respect to the length of the sheet,

wrapping the left and right ends of the sheet around the periphery of the roll,

taping the overlap of the two ends of the sheet with adhesive tape,

pulling the string or rope on the top or bottom end of the sheet towards the center of the steel roll with respect to the diameter of the roll, such that the sheet comes together to form a circular aperture of smaller diameter than the inside diameter of the roll and overlaps the aperture in the steel roll,

placing an inside diameter protector inside the inner diameter of the steel roll and forcing the sheet overlapping the steel roll back against the inner periphery of the steel roll, and

repeating said steps of pulling the string or rope and placing an inside diameter protector on the other of the top or bottom end of the sheet.

9. The method of claim 8 further comprising the step of measuring the length, inside diameter, and

outside diameter of the steel roll and calculating the size of the sheet required to accommodate the roll.

10. A system for wrapping a cylinder of rolled material comprising:

a tear-resistant sheet for wrapping around said cylinder, said sheet forming a plurality of holes along its length at each of its upper and lower ends,

a string or rope threaded through said upper holes, and

a string or rope threaded through said lower holes.

11. The system of claim 10 wherein said sheet is rectangular and has a width slightly greater than the sum of the length of the rolled material and the difference between the inside diameter of the rolled material and the outside diameter of the rolled material, and has a length slightly greater than the periphery of the rolled material.

12. The system of claim 11 further comprising an inside diameter protector for inserting inside the cylinder after the tear-resistant sheet has been wrapped around said cylinder.

13. The system of claim 10 further comprising an inside diameter protector for inserting inside the cylinder after the tear-resistant sheet has been wrapped around said cylinder.

14. The system of claim 10 in combination with a steel roll.

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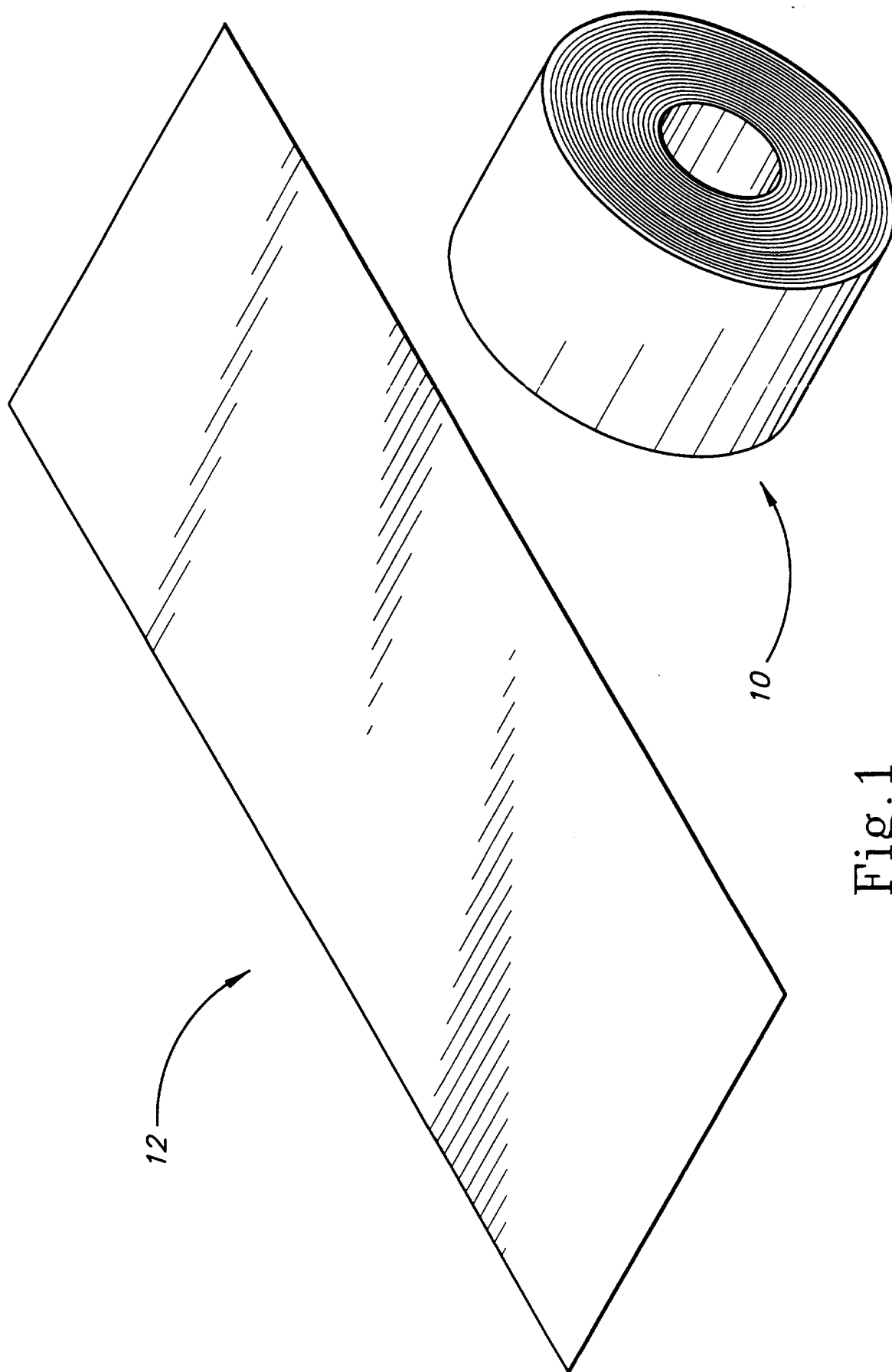


Fig. 1

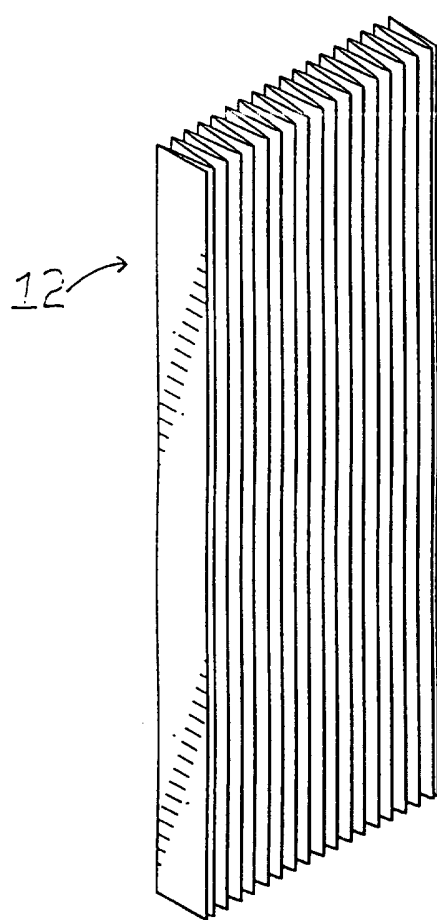


Fig. 2

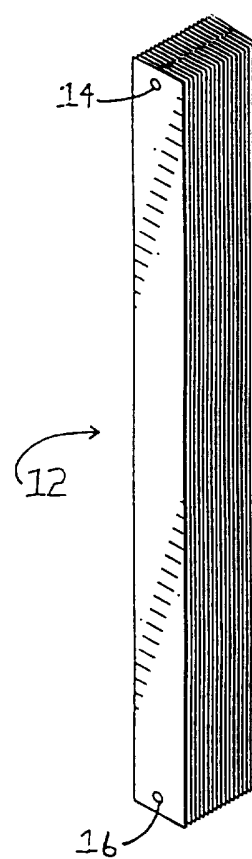
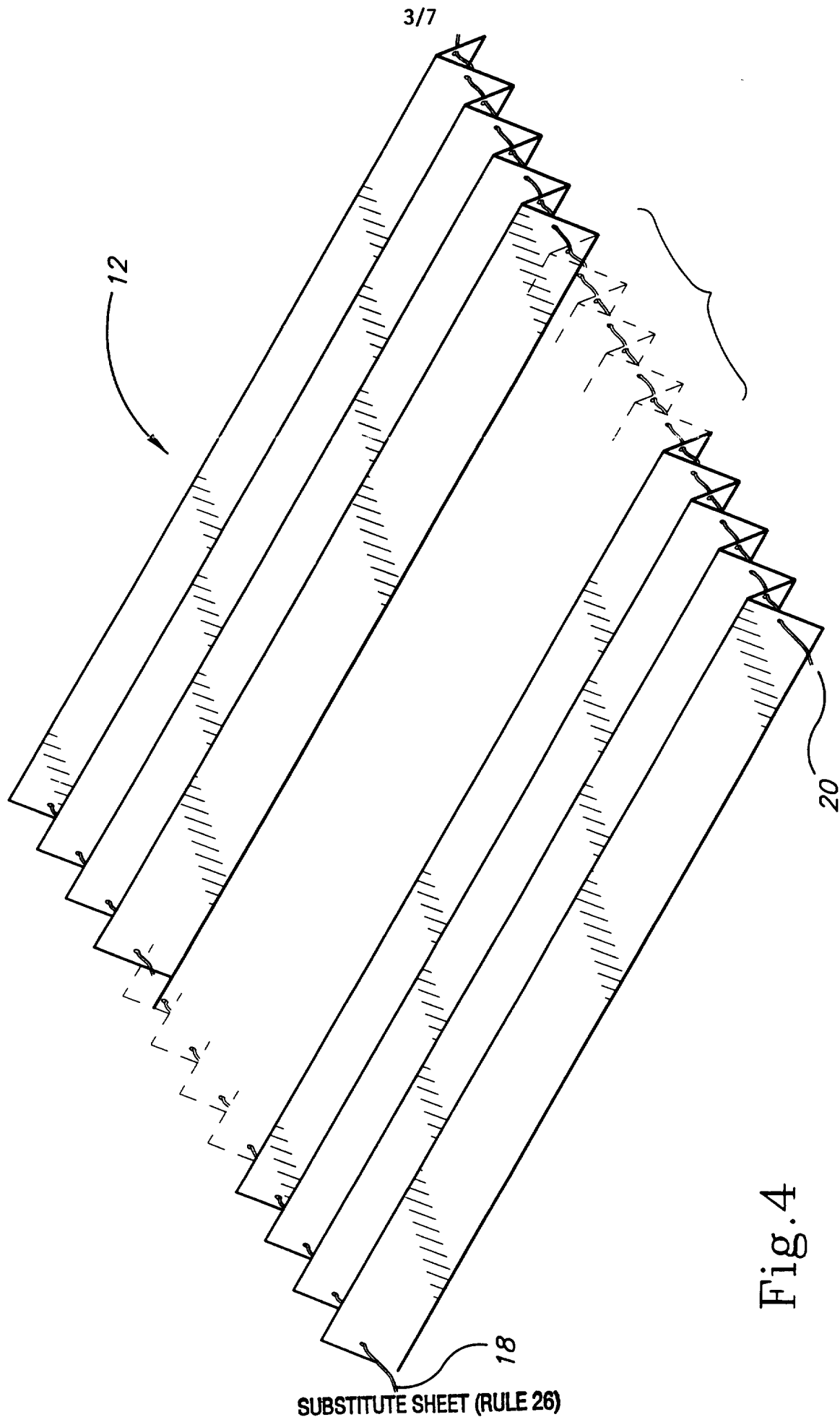


Fig. 3



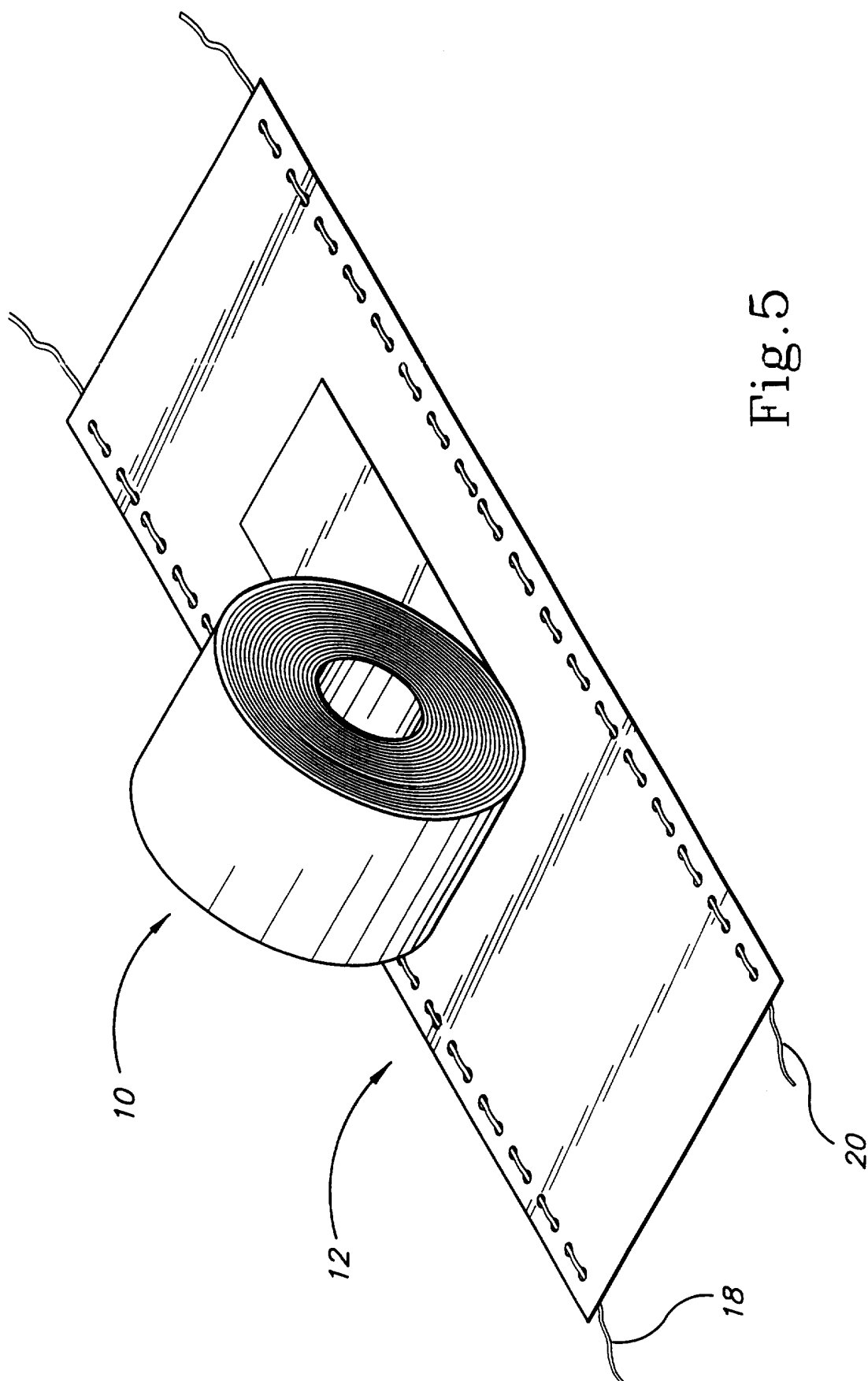
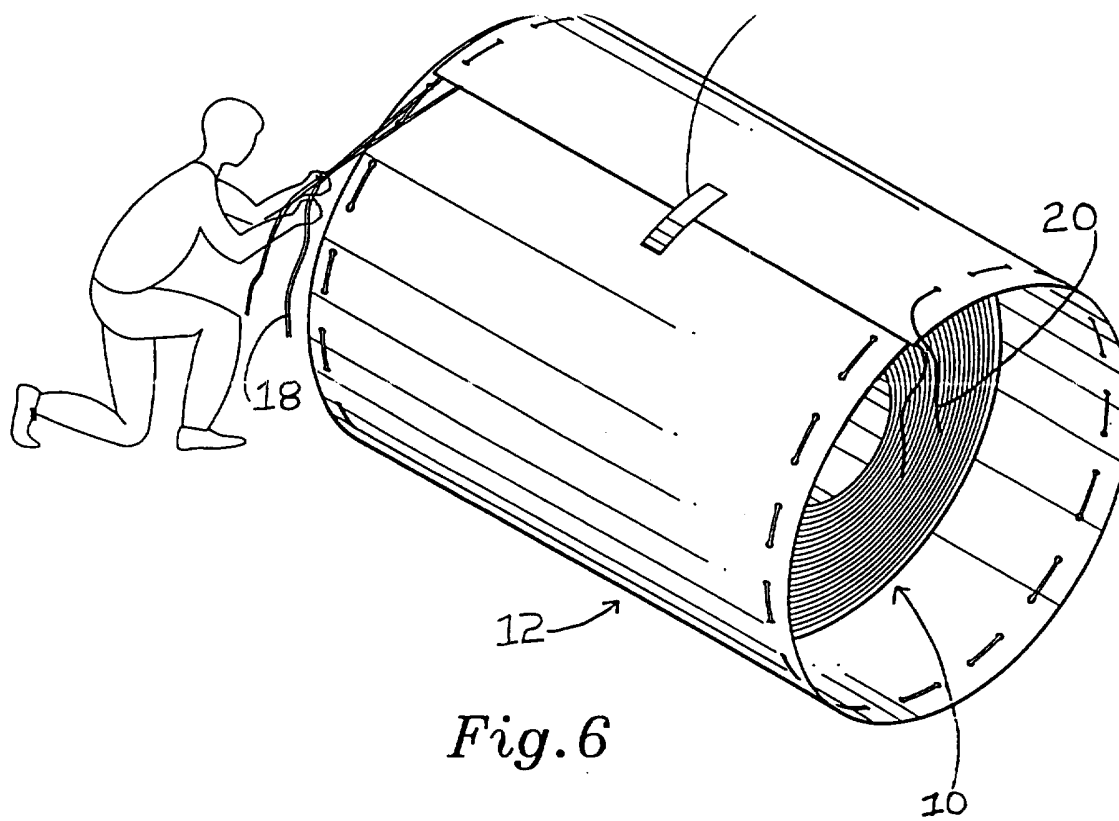


Fig. 5

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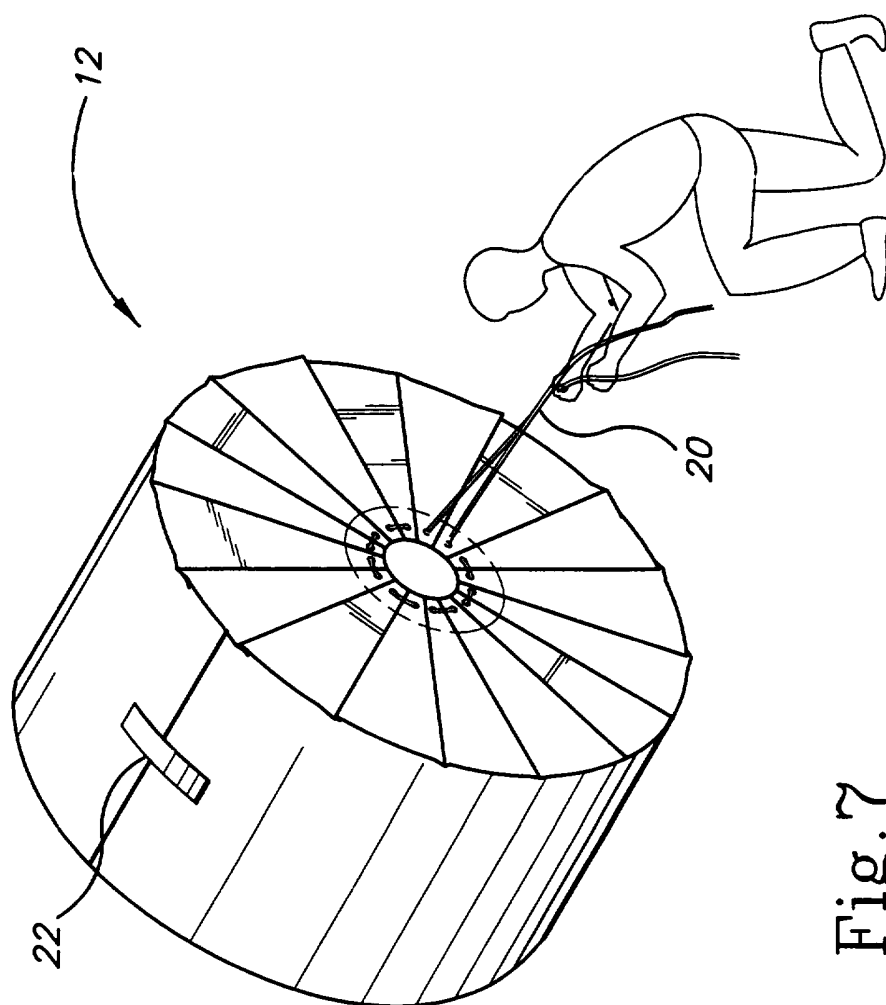


Fig. 7

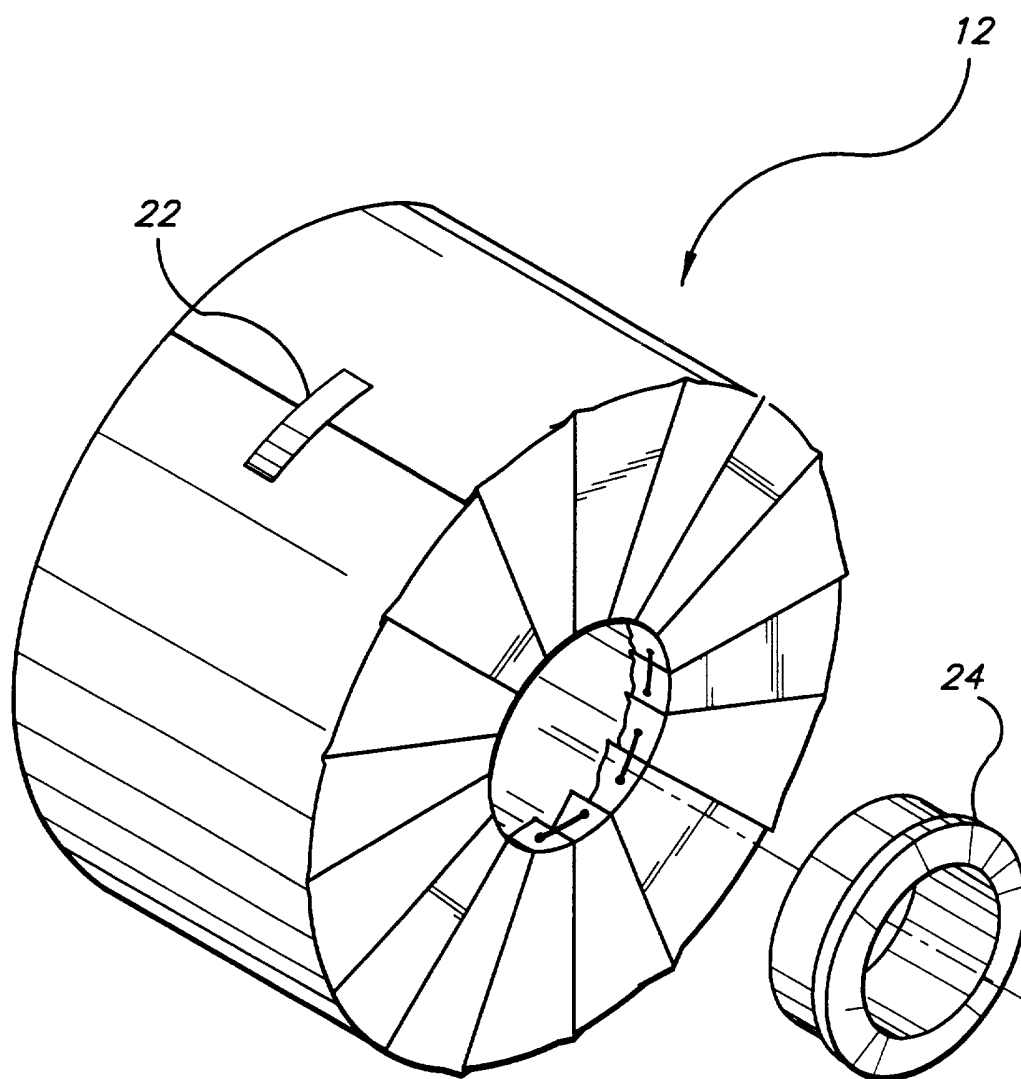


Fig.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/16061

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : B65B 11/00, 25/24; B65D 85/66

US CL : 53/409, 414, 461; 206/397

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 53/414, 461; 206/398, 400, 403, 413, 414, 415, 416

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	JP, 3-29764 A (MINATO) 02 JULY 1991, SEE CONSTITUTION	1,2,6 ----- 3-5,9-14
Y	US 5,020,664 A (HUGHES ET AL.) 04 June 1991, col. 2, lines 20-40	7-9
A	US 2,199,114 A (ROSENBERG) 30 APRIL 1940, COL. 2, LINES 28-35	NONE
A	US 2,586,078 A (O'MALLEY) 19 FEBRUARY 1952, COL. 4, LINES 15-20	NONE
A	JP, 5-4627 A (OTA) 14 JANUARY 1993, SEE constitution	NONE

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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24 DEC 1996

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US96/16061

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CA, 568,101 A (HOUSE ET AL.) 30 DECEMBER 1958, COL. 3, LINES 43-57	NONE