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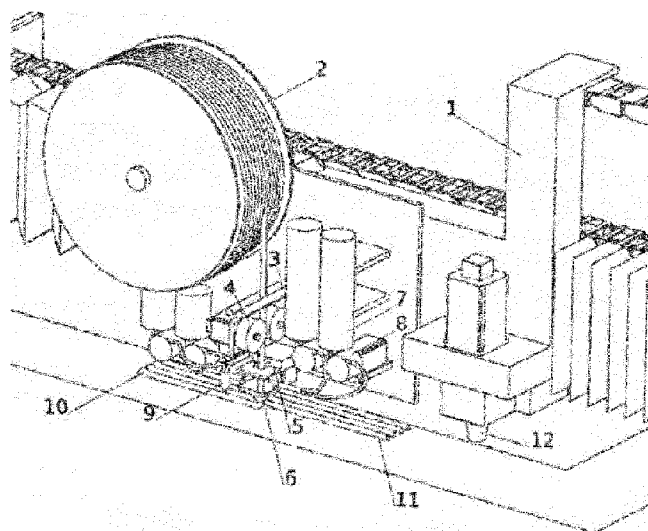
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DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
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MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ,
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TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(54) Title: DEVICE FOR AUTOMATIC REINFORCEMENT OF STRUCTURES, AND METHOD FOR AUTOMATIC REINFORCEMENT OF STRUCTURES

Fig. 1



(57) Abstract: The object of the invention is the device for automatic reinforcement of structures, especially concrete structures, which has: - a manipulator (1) with the means for precisely moving it in space, - a printhead located on the endpiece of the manipulator (1), - a reinforcement fibre storage unit (2) in the form of a reel, located preferably on the printhead, characterized in that the reinforcement fibre storage unit (2) is connected to the means for laying the fibre on the surface of the structure being reinforced, where said means have drive rollers (4) and a cutting knife (5). The object of the invention is also the method for automatic reinforcement of structures, where said method uses a remote- controlled device.



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A. CLASSIFICATION OF SUBJECT MATTER
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 ADD.
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B. FIELDS SEARCHED
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 B28B B29C E04G

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)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 106 738 190 A (CHONGQING ZHIDE CULTURE DISSEMINATION CO LTD) 31 May 2017 (2017-05-31) paragraph [0014] - paragraph [0017]; figure 3	1,5,9
X	WO 01/96223 A1 (ISOGRID COMPOSITES INC [US]) 20 December 2001 (2001-12-20) page 5, line 4 - page 11, line 2; figures 1-5b	1,2
X	US 2009/229760 A1 (HAMLYN ALEXANDER [FR] ET AL) 17 September 2009 (2009-09-17) paragraph [0036] - paragraph [0038] paragraph [0062] - paragraph [0072]; figures	1,3,6
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Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>	<p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>
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Date of the actual completion of the international search 27 March 2020	Date of mailing of the international search report 06/04/2020
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Orij, Jack
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INTERNATIONAL SEARCH REPORT

International application No
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 803 475 A1 (JOACHIM KEIM GMBH [DE]) 19 November 2014 (2014-11-19)	1,4
A	paragraph [0051] - paragraph [0059]; figure 1	10-19

X	US 2013/174969 A1 (KARB INGO [DE] ET AL) 11 July 2013 (2013-07-11)	1,4
A	paragraph [0039] - paragraph [0055]; claims 1,6,26; figures 8a,8b	10-19

X	US 2005/067731 A1 (BRUYERE ALAIN [FR]) 31 March 2005 (2005-03-31)	1,4,8
A	paragraph [0022] - paragraph [0026] paragraph [0055]; figures 1,7 paragraph [0023] - paragraph [0032]	10-19

X	US 2017/341300 A1 (RUDOLPH NATALIE [US] ET AL) 30 November 2017 (2017-11-30)	1,4,7, 10-12,15
	paragraph [0039] - paragraph [0063]; figures 1-7,10	

X	CN 107 756 594 A (UNIV WUHAN TECH) 6 March 2018 (2018-03-06)	1,4,5,9
	abstract; figures	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2019/069290

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1, 2, 5, 9

A device for automatic reinforcement structures which has
guide rollers

2. claims: 3, 4, 6-8, 10-19

A device for automatic reinforcement structures which has a
saturation

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/069290

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2019/069290

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