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(54) Title: CONCRETE SCREEDING MACHINE WITH WALL EDGE SCREEDING FEATURE

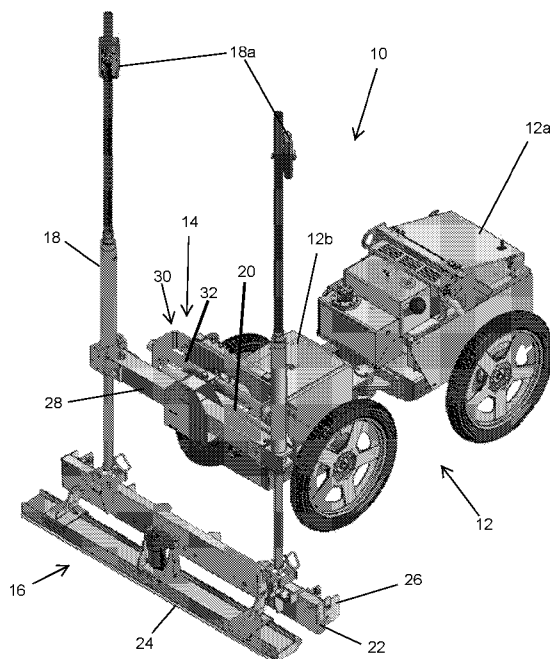


FIG. 1

(57) Abstract: A screeding machine for screeding uncured concrete includes a base unit, a support mechanism disposed at an end portion of the base unit, and a screed head assembly supported at the support mechanism. The screed head assembly includes (i) a grade establishing member and (ii) a vibrating member. The support mechanism includes a lateral actuator that operates to laterally shift the screed head assembly relative to the base unit in a direction orthogonal to a longitudinal axis of the base unit. A control system is operable to control the lateral actuator to laterally shift the screed head assembly in the direction orthogonal to the longitudinal axis of the base unit to move the screed head assembly toward a wall or structure while the screeding machine moves over uncured concrete in a screeding direction via movement of the base unit along the uncured concrete and alongside the wall or structure.



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- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/62335

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:

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I: Claims 1-16, 23-33 directed to the support mechanism comprising a lateral actuator.

Group II: Claims 17-22 directed to the screed head assembly being supported via an elevation actuator.

The inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

--- Continued in Supplemental Box ---

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 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.:
1-16, 23-33

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/62335

A. CLASSIFICATION OF SUBJECT MATTER
IPC - INV. E01C 19/38, E01C 19/22 (2023.01)
ADD. E01C 23/00, E01C 23/01, E01C 19/26 (2023.01)

CPC - INV. E01C 19/38, E01C 19/22, E01C 19/006, E04F 21/242

ADD. E01C 23/00, E01C 23/01, E04F 21/244, E01C 19/26

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)
 See Search History document

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y --- A	WO 2006/133490 A1 (Farrant) 21 December 2006 (21.12.2006), entire document, especially Fig. 1-9, 16-19; page 18, ln 12-20; page 27, ln 32 to page 28, ln 4; page 25, ln 28 to page 26, ln 4; page 25, ln 11-20; page 25, ln 21-27; page 6, ln 7-12; page 13, ln 11-14;	1-5, 8-9, 23-26, 29-31 ----- 1, 6-7, 10-13, 23, 27-28, 31-32 ----- 14-16, 33
Y --- A	US 2007/0116520 A1 (Quenzi et al.) 24 May 2007 (24.05.2007), entire document, especially Fig. 1; para[0021]; para[0024];	1, 10-13, 23, 31-32 ----- 14-16, 33
Y	US 5,752,783 A (Malone) 19 May 1998 (19.05.1998), entire document, especially Fig. 1-4; col 2, ln 61 to col 3, ln 18; col 4, ln 15-24; col 4, ln 25-36; col 4, ln 37-46;	6-7, 27-28
Y --- A	US 2007/0127985 A1 (Halonen et al.) 07 June 2007 (07.06.2007), entire document, especially Fig. 16, 20; para[0100]; para[0095]; para[0107]; para[0103]; para[0105];	13, 32 ----- 14-16, 33
A	US 2009/0175681 A1 (Pietila et al.) 09 July 2009 (09.07.2009), entire document, especially Fig. 1; para[0033]; para[0045];	14-16, 33
A	CN 105442417 A (JINAN LUFANGZHIHE INFORMATION TECHNOLOGY CO., LTD.) 30 March 2016 (30.03.2016), entire document	1-16, 23-33
A	US 4,197,032 A (Miller) 08 April 1980 (08.04.1980), entire document	1-16, 23-33

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

* Special categories of cited documents:	“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
“A” document defining the general state of the art which is not considered to be of particular relevance	“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
“D” document cited by the applicant in the international application	“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
“E” earlier application or patent but published on or after the international filing date	“&” document member of the same patent family
“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)	
“O” document referring to an oral disclosure, use, exhibition or other means	
“P” document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 05 May 2023 (05.05.2023)	Date of mailing of the international search report JUL 26 2023
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Kari Rodriguez Telephone No. PCT Helpdesk: 571-272-4300
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 23/62335

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2018/0088102 A1 (Somero Enterprises, Inc.) 29 March 2018 (29.03.2018), entire document	1-16, 23-33
A	US 2018/0327982 A1 (Somero Enterprises, Inc.) 15 November 2018 (15.11.2018), entire document	1-16, 23-33
A	US 5,129,803 A (Nomura et al.) 14 July 1992 (14.07.1992), entire document	1-16, 23-33

--- Continuation of Box No. III Observations where unity of invention is lacking ---

SPECIAL TECHNICAL FEATURES

The invention of Group I includes the special technical feature of the support mechanism comprises a lateral actuator that operates to laterally shift the screed head assembly relative to the base unit in a direction orthogonal to a longitudinal axis of the base unit; and a control system, wherein the control system is operable to control the lateral actuator to laterally shift the screed head assembly in the direction orthogonal to the longitudinal axis of the base unit, not required by the claims of Group II.

The invention of Group II includes the special technical feature of the screed head assembly is supported at the support mechanism via an elevation actuator, and wherein the elevation actuator operates to adjust elevation of the screed head assembly responsive at least in part to an elevation sensor that senses elevation of the screed head assembly, and wherein, responsive to the elevation sensor, the elevation actuator is operated to set the grade of the uncured concrete; and a mode adjusting device that operates to set the screeding machine in one of a sensor control mode, where the screed head assembly is adjusted via the elevation actuator and responsive to the elevation sensor, and a float mode, where the vibrating member and grade establishing member float on the concrete or forms at the concrete, not required by the claims of Group I.

COMMON TECHNICAL FEATURES

Groups I and II share the common technical features of a screeding machine for screeding uncured concrete, the screeding machine comprising: a base unit; a support mechanism disposed at an end portion of the base unit; a screed head assembly supported at the support mechanism, wherein the screed head assembly comprises (i) a grade establishing member and (ii) a vibrating member; and a control system (generally).

However, this shared technical feature does not represent a contribution over prior art as being anticipated by US 2007/0116520 A1 (Quenzi et al.), which discloses a screeding machine for screeding uncured concrete (10, Fig. 1; para[0021], 'a screeding device or machine 10'), the screeding machine comprising: a base unit (12, 14, Fig. 1; para[0021], 'a wheeled base unit 12 and an extendable or telescoping boom assembly 14 which extends from base unit 12'); a support mechanism disposed at an end portion of the base unit (14a, Fig. 1 - see support mechanism disposed at end portion 14a of the base unit; para[0021], 'A screed head assembly 16 is adjustably mounted at an outer end 14a of extendable boom 14'); a screed head assembly supported at the support mechanism (16, Fig. 1; para[0021], 'a screed head assembly 16'), wherein the screed head assembly comprises (i) a grade establishing member (18, 20, Fig. 1; para[0021], 'Plow 20 and auger device 18 function to establish the grade of the uncured concrete surface') and (ii) a vibrating member (22, Fig. 1; para[0021], 'a vibrating device 22').

As the common technical features were known in the art at the time of the invention, these cannot be considered special technical feature that would otherwise unify the groups.

Therefore, Groups I-II lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.