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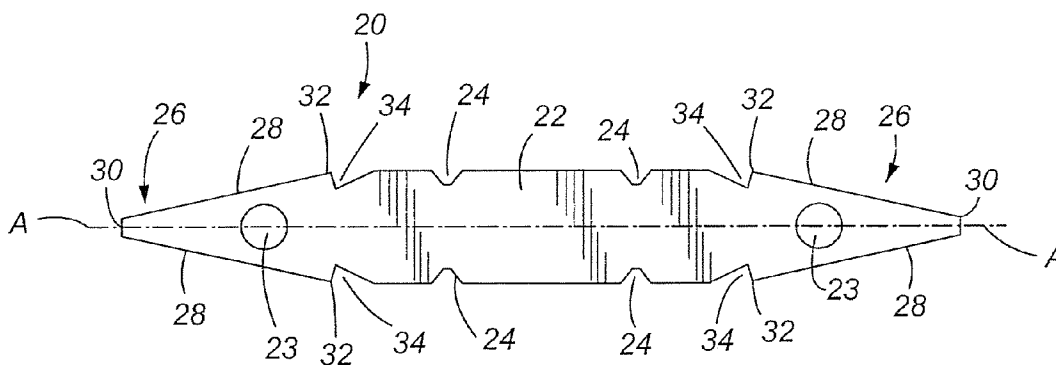
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(54) Title: CONCRETE TIE WITH REUSABLE WEDGE



(57) Abstract: An improved tie rod for use in concrete construction is provided. The tie rod has opposing ends, referred to as ears that may be used as wedges in a subsequent concrete construction operation. In a first wall form system, the ears of the tie rod are broken off when the forms are stripped from the cured concrete structure. The ears of the tie rod have tapered shapes enabling them to be used as wedges in a second or subsequent wall form system. The wedges are used with pins that secure abutting edges of adjacent wall form panels.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/64821

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **B23P 11/00(2006.01);B21D 39/00(2006.01);E04G 17/07(2006.01)**

USPC: 29/428,700;249/214,218

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. : 29/428, 700; 249/214, 218

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 1,978,963 A (SCHWAAB) 30 October 1934 (30.10.1934), Figs. 1-5.	1-22
A	US 1,708,634 A (REES) 09 April 1929 (09.04.1929), Figs. 1-5.	1-22
A	US 1,850,462 A (KINNINGER) 22 March 1932 (22.03.1932), Figs. 1-5.	1-22

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents:


- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent published on or after the international filing date
- "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

- "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
- "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
- "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
- "&" document member of the same patent family

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/64821

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:
Please See Continuation 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 additional fees, this Authority did not invite payment of any 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.

BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

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 examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-5 and 10-22, drawn to form tie.

Group II, claim(s) 6-9, drawn to method of assembling a wall form.

The inventions listed as Groups I and 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: the special technical feature of the tie is possessing a taper at both ends with openings therethrough and rebar channels along the edges thereof. The special technical feature of the method is utilizing a broken portion of a tie rod as a securing pin.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

Fig. 2;
Fig. 8;
Fig. 10.

The claims are deemed to correspond to the species listed above in the following manner:

Fig. 2: claims 1-11 and 21.
Fig. 8: claims 1-16, 21, and 22
Fig. 10: claims 6-9, 17-20, and 22.

The following claim(s) are generic: None.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: Fig.2 has taper from wider to smaller towards the distal tip and a flat profile. Fig.8 has taper from wider to smaller towards the distal tip and a raised central portion extending longitudinally along the body. Fig.10 has taper from smaller to wider towards the distal tip.