



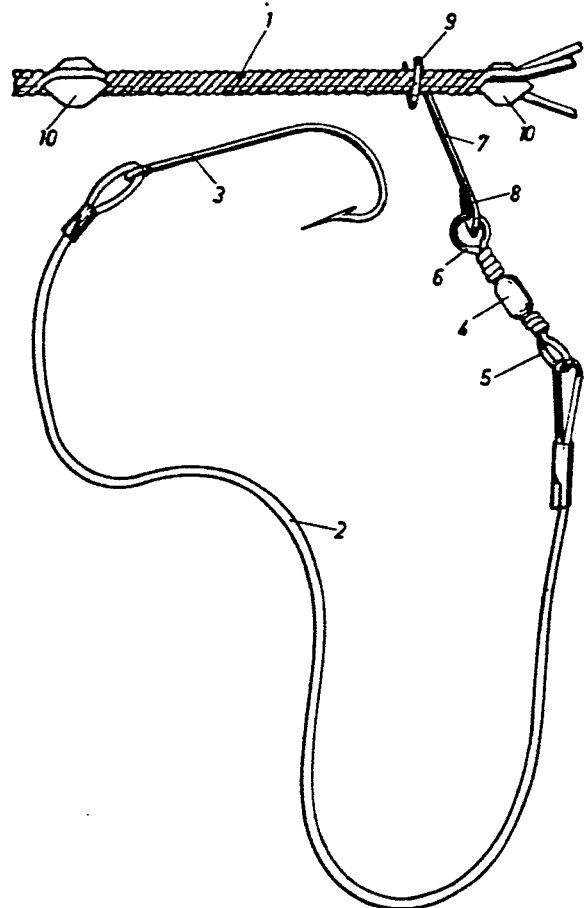
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification⁴ : A01K 91/04</p>	<p>A1</p>	<p>(11) International Publication Number: WO 87/ 03778 (43) International Publication Date: 2 July 1987 (02.07.87)</p>
<p>(21) International Application Number: PCT/SE86/00575 (22) International Filing Date: 16 December 1986 (16.12.86) (31) Priority Application Number: 8505972-3 (32) Priority Date: 17 December 1985 (17.12.85) (33) Priority Country: SE</p> <p>(71) Applicant (for all designated States except US): ARB-CONSTRUCTION AB [SE/SE]; Box 7096, S-371 07 Karlskrona (SE). (72) Inventor; and (75) Inventor/Applicant (for US only) : GUSTAFSSON, Bert, Urban [SE/SE]; Rönnvägen 8, Nävragöl, S-370 34 Holmsjö (SE). (74) Agents: FERKINGHOFF, C-G. et al.; Alfons Hedbergs Patentbyrå AB, Aschebergsgatan 35, S-411 33 Göteborg (SE).</p>		<p>(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), DK, FR (European patent), GB (European patent), IT (European patent), JP, LU (European patent), NL (European patent), NO, SE (European patent), US.</p> <p>Published <i>With international search report. In English translation (filed in Swedish).</i></p>

(54) Title: IMPROVEMENTS IN LONG LINES

(57) Abstract

An improvement in long lines comprising a number of hook leaders (2). The hook leaders are attached to a swivel (4) which in turn is attached to a quick fastener (7). The quick fastener (7) is formed with an end portion (9) of helical coil configuration by means of which the fastener may be attached to the long line (1), said end portion having helices between the turns of which a gap is left through which the long line (1) may be inserted or withdrawn. Between the strands of the long line beads (10) are inserted in pairs, the beads of each such pair defining between them delimited sections along the line, one for each hook (2).



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT Austria	FR France	ML Mali
AU Australia	GA Gabon	MR Mauritania
BB Barbados	GB United Kingdom	MW Malawi
BE Belgium	HU Hungary	NL Netherlands
BG Bulgaria	IT Italy	NO Norway
BJ Benin	JP Japan	RO Romania
BR Brazil	KP Democratic People's Republic of Korea	SD Sudan
CF Central African Republic	KR Republic of Korea	SE Sweden
CG Congo	LI Liechtenstein	SN Senegal
CH Switzerland	LK Sri Lanka	SU Soviet Union
CM Cameroon	LU Luxembourg	TD Chad
DE Germany, Federal Republic of	MC Monaco	TG Togo
DK Denmark	MG Madagascar	US United States of America
FI Finland		

Improvements in Long Lines

The subject invention concerns improvements in long lines to facilitate mounting of swivels and hook leaders (snells) to the long line (main line) in a swift and convenient manner. A plurality of hook
5 leaders (snells) are attached along the main line, the latter being formed with a number of enlargement members which are spaced along the long line in such a manner that pairs of such members define a delimited section between them along the main line. Each such delimited section is intended to receive a hook leader, preferably with the aid of
10 swivels.

Fishing-boats usually are equipped with a large number of long lines and a total of up to 20.000 hooks or more may be used during each fishing trip. Fishing on an industrial scale requires automatization of all operations. For instance, replacement of leaders or hooks must
15 be effected rapidly and efficiently. Hook leaders (snells) of conventional type are mounted on swivels, one loop of which is threaded onto a main line (the long line proper). When hook leaders are attached to the line, pairs of knots are made in the line to divide the latter into separate areas or sections, one for each individual swivel with its
20 associated hook leader attached thereto. This manner of attaching hook leaders is complicated and far from efficient. Replacement of swivels with their associated hook leaders becomes a time-consuming and difficult task.

The purpose of the subject invention is to provide improvements
25 in long lines allowing the hook leaders to be connected and disconnected from the main line easily and rapidly for exchange and replacement. This purpose is achieved in accordance with the invention by providing each hook leader with a quick fastener by means of which the hook leader is attached to the long line, said quick fastener having an
30 end portion in the shape of a helical coil, an open gap being formed intermediate the helices of said fastener end portion for introduction of the long line.



Further purposes and advantages gained by the invention will become apparent from the dependent claims.

The invention will be described in closer detail in the following with reference to the accompanying drawings, wherein

5 Fig. 1 is a general view of a long line provided with a swivel and its associate hook leader,

Fig. 2 is a plan view of a quick fastener (clip) for attachment of the swivel and its associate hook leader to the long line,

10 Figs. 3 and 4 are detail views showing the attachment of the quick fastener to the long line, and

Fig. 5 is a partly sectional view showing an alternative embodiment of a swivel in accordance with the invention.

Fig. 1 illustrates a long line or main line 1 to which are attached a number of hook leaders 2, each one of which is provided at 15 one of its ends with a hook 3 of a conventional type. At its opposite end the hook leader 2 is secured to one 5 of the end loops 5, 6 of a swivel 4. The structure of the swivel 4 is such as to ensure that its end loops 5, 6, one at each swivel end, may rotate relative to each other. The loop 6 opposite loop 5 of the swivel 4 is attached to a 20 quick fastener (clip) 7. The quick fastener (clip) 7 has a coil 8 for engagement with the loop 6 of the swivel 4.

The quick fastener 7 is mounted on the main long line 1 in the manner appearing from Figs. 3 and 4. The line is introduced into the gap formed intermediate the helices of the helical coil end portion 9 25 of the quick fastener 7. Arrow P₁ in Fig. 3 indicates the most convenient manner of attaching the quick fastener (clip) to the long line/main line. Fig. 4 illustrates the quick fastener 7 when attached to the line. In a corresponding manner, the quick fastener 7 is easily detached from the long line 1.

30 Beads 10 are enclosed or encapsuled into the main line. The beads 10 are inserted between the strands of the line 1 during the line-making proper. To make it possible to introduce the beads 10 between the strands it is necessary that the introduction operation is performed

rapidly and for this reason it is preferably performed by means of a hydraulic tool positioned adjacent the strand catcher (guide). The beads are inserted in pairs spaced apart by 8 to 10 cm, thus defining between them delimited areas or sections along the line for each individual hook leader 2. The spacing between the pairs of beads may be varied to suit the type of long-line fishing for which the line is intended. A typical spacing is between 1.5 and 3 metres.

Preferably, the beads 10 are made from plastics, preferably polyurethane plastics. The beads should be able to withstand cold and impacts and be somewhat resilient. Polyurethane plastics has a low specific weight which could be varied in the manufacture of the beads. The low specific weight is advantageous because it ensures that the long line will sink comparatively slowly. Fish bite predominantly during the sinking movement of the line through the water and the slow sinking movement of the line caused by the low specific weight therefore is instrumental in obtaining good catches. The beads 10 are formed with grooves 11 in which lodge the strands of the line.

The hook leaders 2 preferably are manufactured from extruded monofilament nylon. Spun or braided hook leaders tend to absorb smells with impaired fish catches as a result. However, the strength of monofilament nylon is drastically lowered when knots are made in the hook leader line. Weak points of this kind may be avoided by using special sleeves which are clamped about the hook leader lines with the aid of pliers of a special design. Fig. 1 shows one way of designing a nylon hook leader without knots.

Fig. 5 shows a swivel 11 comprising a quick fastener portion 12 consisting of a double-thread section bent to the desired shape. The sleeve of the swivel 11 is upset into gripping engagement with the quick fastener portion 12 as well as with the attachment portion of the loop 5.

The embodiments of the invention described above are to be regarded as examples only and a number of other embodiments and modifications are possible within the scope of the appended claims.

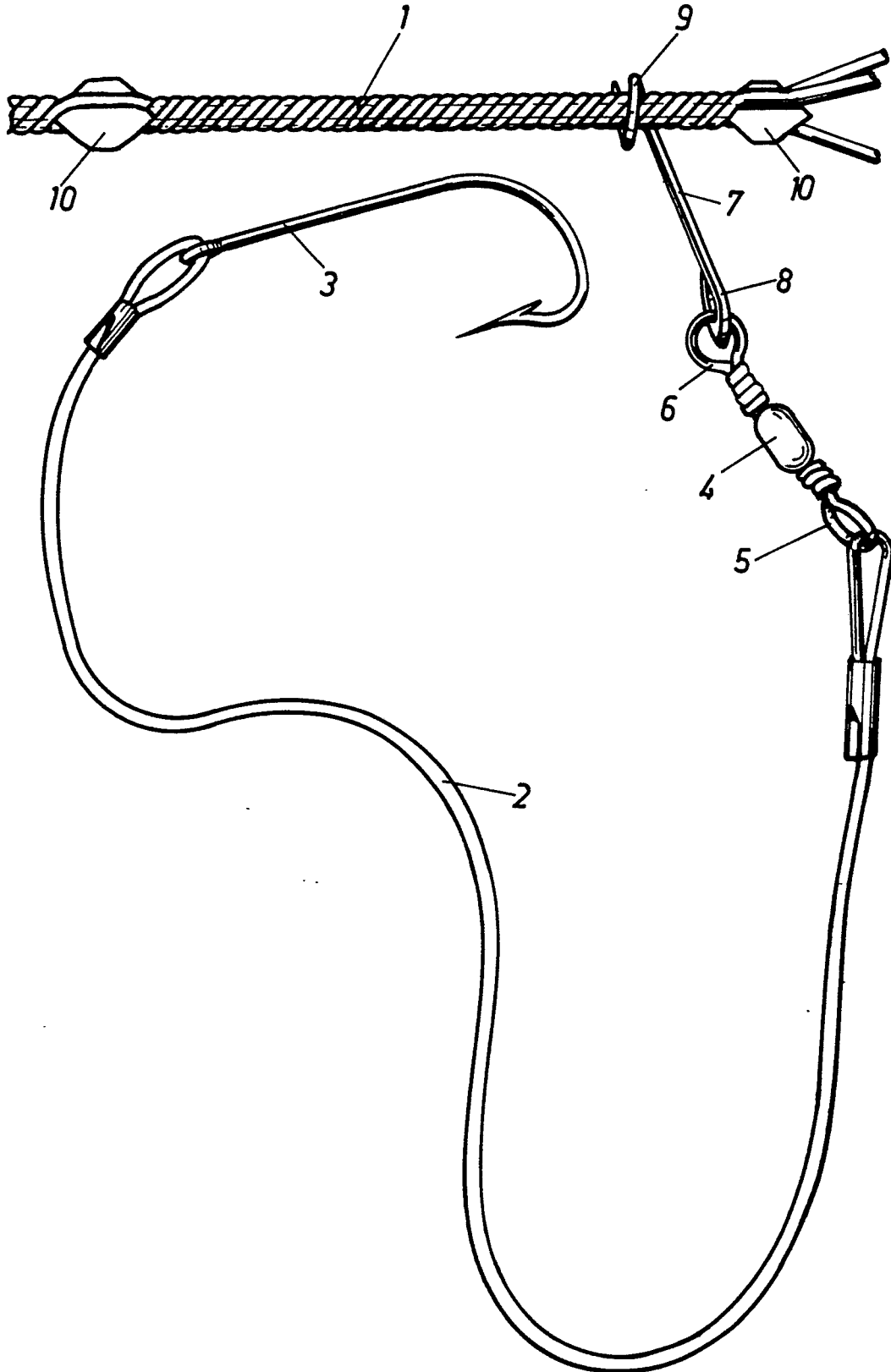
CLAIMS

1. An improvement in long lines to which are attached a number of hook leaders (2), each long line (1) being provided with a number of enlargement members which are arranged in pairs to divide the long line
5 into delimited sections, one for each hook (2), c h a r a c t e r -
i z e d therein that each hook leader (2) is provided with a quick
fastener (7, 12) by means of which the hook leader may be attached to
the long line, said quick fastener having an end portion (9) in the
shape of a helical coil and in that an open gap is formed intermediate
10 the helices of said fastener end portion for introduction of the long
line (1).

2. An improvement in long lines in accordance with claim 1,
c h a r a c t e r i z e d therein that the enlargement members
formed in the main line consist of elements (10) intertwined into the
15 long line (1) proper.

3. An improvement in long lines in accordance with claim 1 or
2, c h a r a c t e r i z e d therein that the quick fastener (12) is
directly and rotationally mounted on a swivel (11) so as to form an
integral part thereof.

Fig. 1



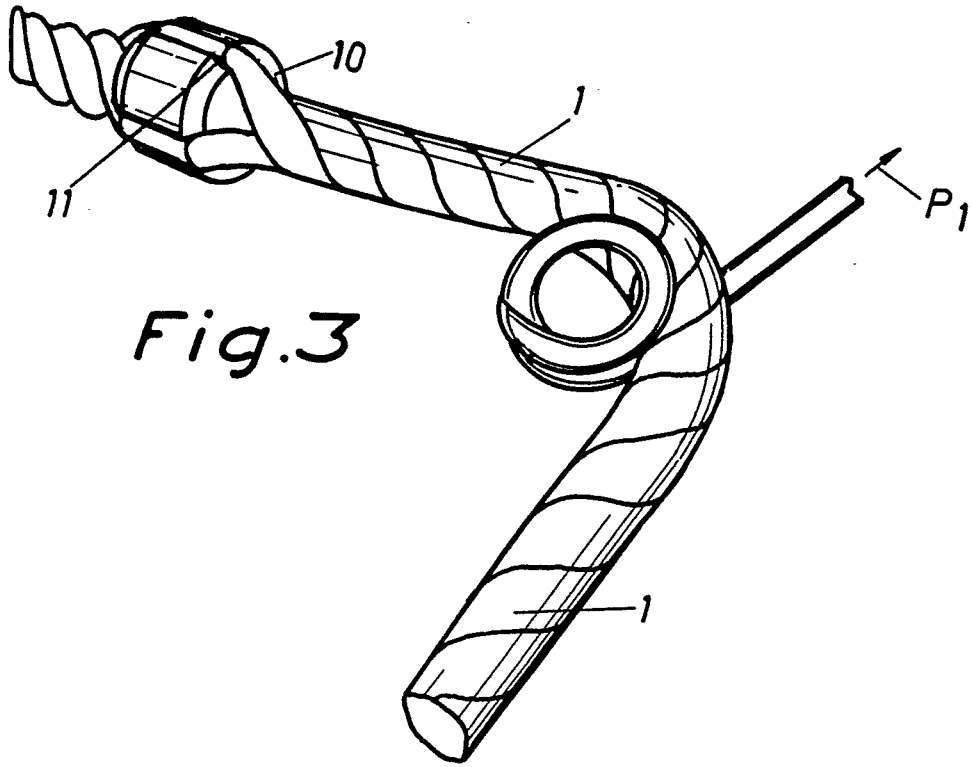


Fig. 3

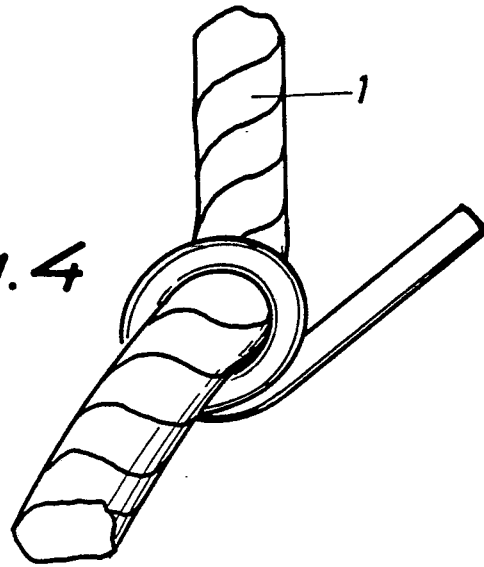


Fig. 4

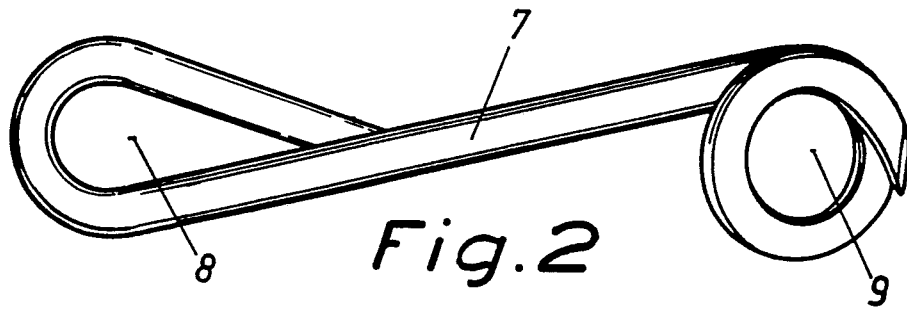
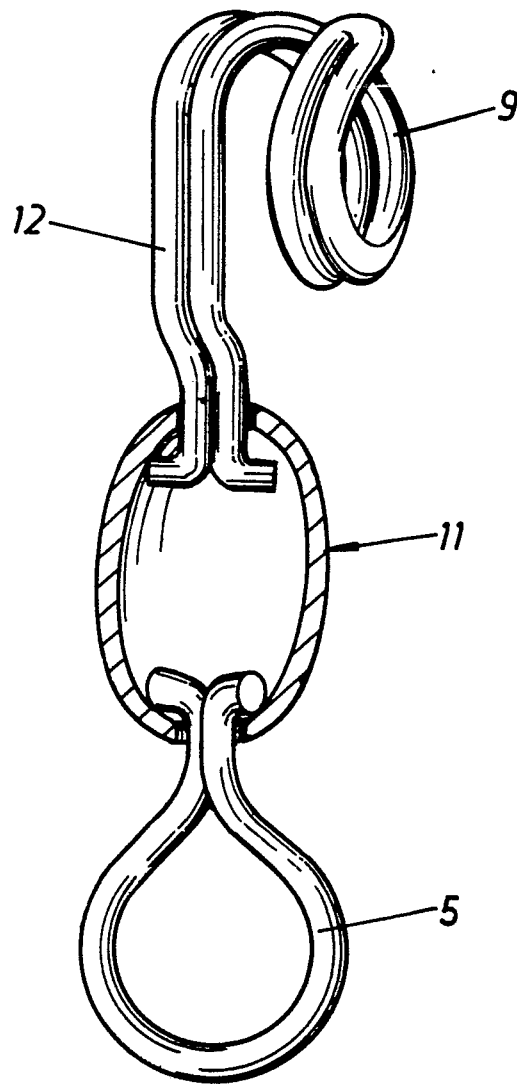


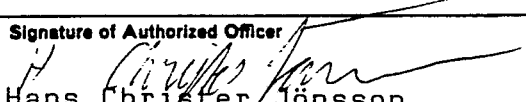
Fig. 2

Fig. 5



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE86/00575

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC ⁴		
A 01 K 91/04		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC 4 US C1	A 01 K 91/00, /04, /06 <u>43:43.1-43.15</u> , 44.83-44.89, 44.92-44.98	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
SE, NO, DK, FI classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ¹⁰	Citation of Document, ¹¹ with Indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
Y	GB, A, 18 962 (G. PURDY) 22 October 1892	1-3
Y	GB, A, 25 511 (F.J. RABBETH) 16 November 1911	1-3
Y	DE, A1, 2 903 689 (HOJIYO ET AL) 3 April 1980 fig. 19, 20, 22. & GB, 2030032 FR, 2437163 AU, 43658/79 JP, 55045351 CA, 1139334 AU, 525571	1-3
A	DK, A, 20 409 (L.F. DE FARELLE) 9 August 1915	1-3
A	DE, A1, 2 855 976 (KAYKA ET AL) 3 July 1980	1-3
A	US, A, 1 858 550 (C.O. KAHLE) 17 May 1932	1-3
<p>¹⁰ Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document 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</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>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
1986-02-25	1987-03-03	
International Searching Authority	Signature of Authorized Officer	
Swedish Patent Office	 Hans Christer Jönsson	