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Circular knitting machines — Vocabulary

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Foreword

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The committee responsible for this document is ISO/TC 72, *Textile machinery and accessories*, Subcommittee SC 3, *Machinery for fabric manufacturing including preparatory machinery and accessories*.

Circular knitting machines — Vocabulary

1 Scope

This International Standard establishes a vocabulary of terms and a system of classification for circular knitting machines used in the textile industry for the production of weft-knitted fabrics.

NOTE See also the ISO online browsing platform (OBP): https://www.iso.org/obp/ui/

2 Terms and definitions

2.1 Terms for circular knitting machines

2.1.1
circular knitting machine
machine for the production of knitted fabrics with independent needles, longitudinally movable, in circular arrangement, with stitches formed one after the other within every course from yarn fed crosswise to the length of the fabric

[SOURCE: ISO 7839:2005, 2.1.2]

Note 1 to entry: The circular knitting machine can be specified more precisely with the following details:

— model (e.g. small, large);

— construction features (e.g. single jersey, double jersey, plain interlock, purl);

— needle type (e.g. latch or slide needle);

— number of feeders (e.g. 48 stitch feeders);

— patterning mechanism (e.g. jacquard unit).

2.1.2
small-diameter circular knitting machine
circular knitting machine with nominal diameter up to 165 mm

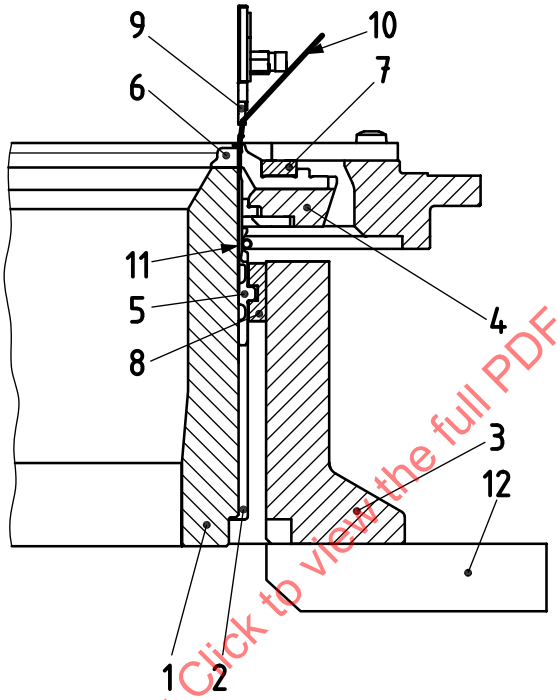
2.1.3
large-diameter circular knitting machine
circular knitting machine with nominal diameter of over 165 mm

2.2 Terms for construction features of circular knitting machine (according to number and classification of needle carrier)

2.2.1
RL circular knitting machine
circular knitting machine for the production of single-face fabrics (RL) by means of needles arranged in grooves of one carrier

[SOURCE: ISO 7839:2005, 2.1.2.1]

Note 1 to entry: See Figure 1.



Key

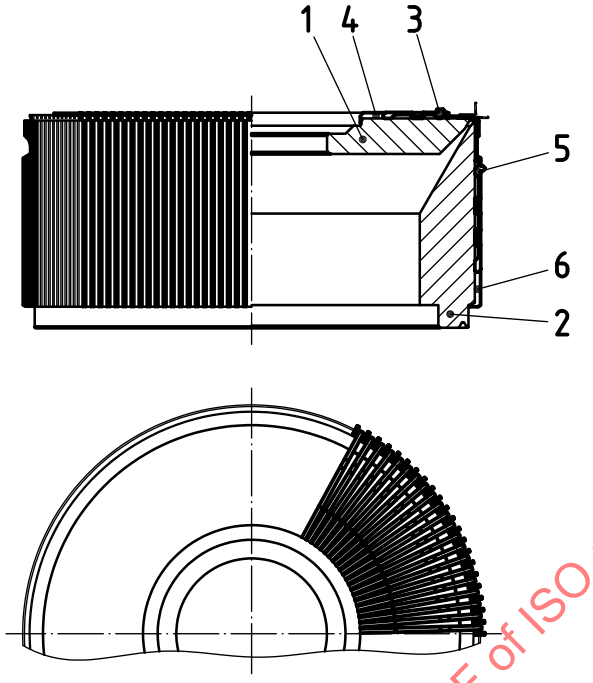
1	needle cylinder	7	sinker cam
2	trick	8	needle cam
3	cylinder cam box	9	yarn guide
4	sinker ring	10	yarn
5	needle	11	holding spring
6	sinker	12	cam box plate

Figure 1 — RL circular knitting machine

2.2.2
RR circular knitting machine
circular knitting machine, used mainly for the production of double-face fabrics (RR) by means of needles arranged in an axial direction in grooves of the needle cylinder and radially in grooves of the needle disc (dial) in staggered formation to one another

[SOURCE: ISO 7839:2005, 2.1.2.2]

Note 1 to entry: See Figure 2.



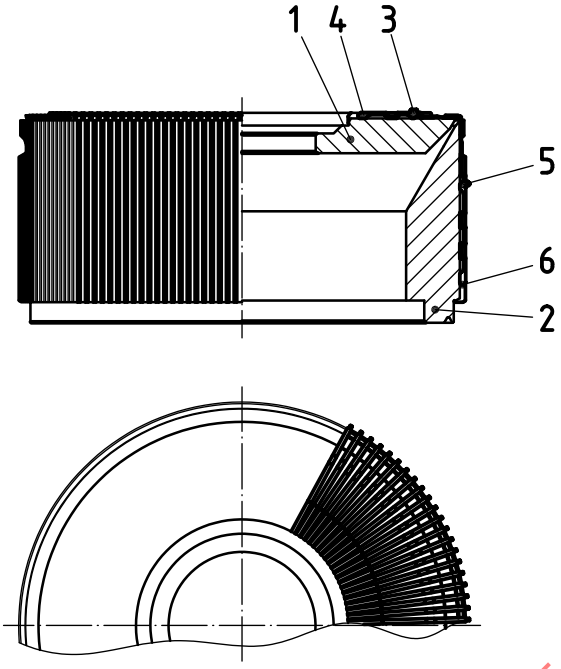
Key

1 needle disc
2 needle cylinder
3 disc needle
4 trick
5 cylinder needle
6 trick

Figure 2 — Construction features RR circular knitting machine

2.2.3
interlock circular knitting machine
interlock knitting machine used for the production of plain interlock fabric with needles arranged opposite each other in needle cylinder grooves in the axial direction and radial in needle disc (dial) grooves

Note 1 to entry: See Figure 3.



Key

1 needle disc
2 needle cylinder
3 disc needle
4 trick
5 cylinder needle
6 trick

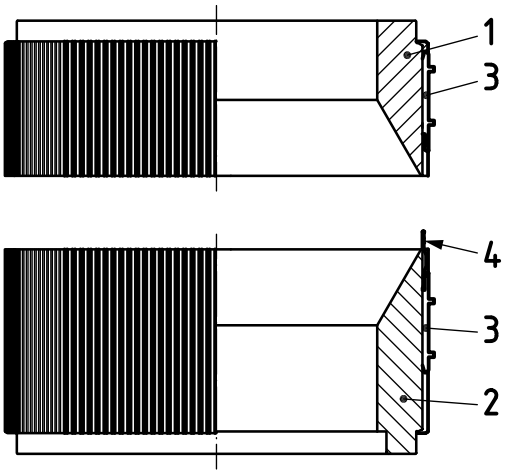
Figure 3 — Construction features interlock circular knitting machine

2.2.4
LL circular knitting machine
circular knitting machine for the production of purl fabrics (LL) with two needle cylinders, one upon the other, within their grooves, which are arranged flush to each other in an axial direction, the needles moved from one needle cylinder to the other by means of a needle slider

[SOURCE: ISO 7839:2005, 2.1.2.3]

Note 1 to entry: LL fabrics can contain structures like single-face fabric and/or double-face fabric, respectively can be replaced by them completely.

Note 2 to entry: See Figure 4.



Key

1 upper needle cylinder
2 lower needle cylinder
3 needle slider
4 double-ended needle

Figure 4 — Construction features LL circular knitting machine

2.3 Dimensions

2.3.1
machine depth
a
total depth of machine without space requirement for additional equipment

EXAMPLE Bobbin holders, control cabinets.

Note 1 to entry: See Figure 5.

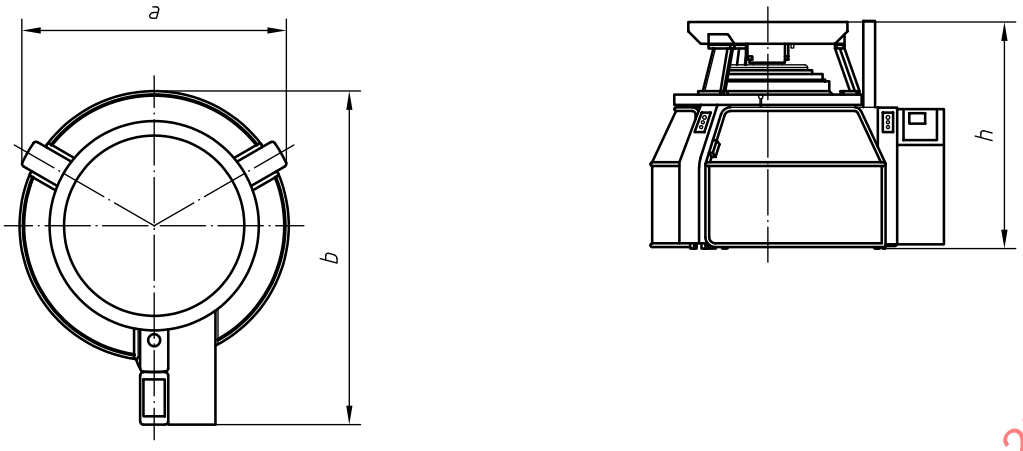
2.3.2
machine width
b
total width of machine without space requirement for additional equipment

EXAMPLE Bobbin holders, control cabinets.

Note 1 to entry: See Figure 5.

2.3.3
machine height
h
total height of machine without space requirement for yarn guide units

Note 1 to entry: See Figure 5.



Key

a machine depth

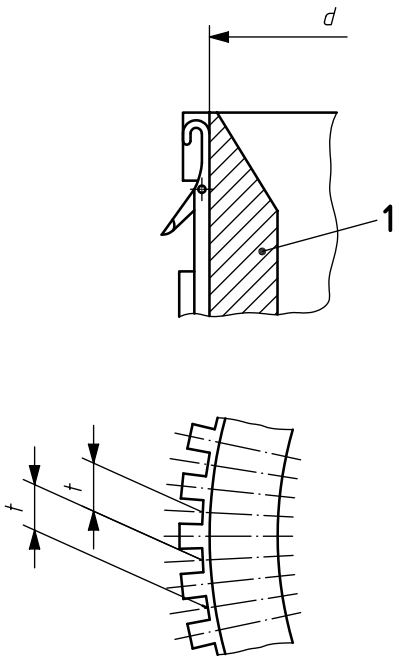
b machine width

h machine height

Figure 5 — Dimensions RR circular knitting machine

2.3.4
nominal diameter
diameter of a circular knitting machine which corresponds to the exact or rounded needle base diameter *d*

Note 1 to entry: See Figure 6.



Key

1 needle cylinder

d nominal diameter of machine

t pitch

Figure 6 — Nominal diameter and pitch of circular knitting machines

2.3.5
pitch
t
distance between the centres of two adjacent needles in the same needle carrier, in millimetres, with full use of needles

[SOURCE: ISO 8188:2007, 3.1]

Note 1 to entry: The pitch at circular knitting machines is the distance between the centres of two adjacent needles on the circumference of the nominal diameter.

Note 2 to entry: See Figure 6.

2.3.6
gauge
E
number of needles, *n*, per reference length of 25,4 mm with full use in the needle carrier:

$$n = \frac{n}{25{,}4\ \text{mm}}$$

[SOURCE: ISO 8188:2007, 3.2.1]

Note 1 to entry: The indication of needle pitch shall be preferred to the indication of needle gauge.

2.3.7
number of needles
number of needles present in a needle carrier

Note 1 to entry: The number of needles is equal to the nominal width, *n*, divided by the pitch, plus 1.

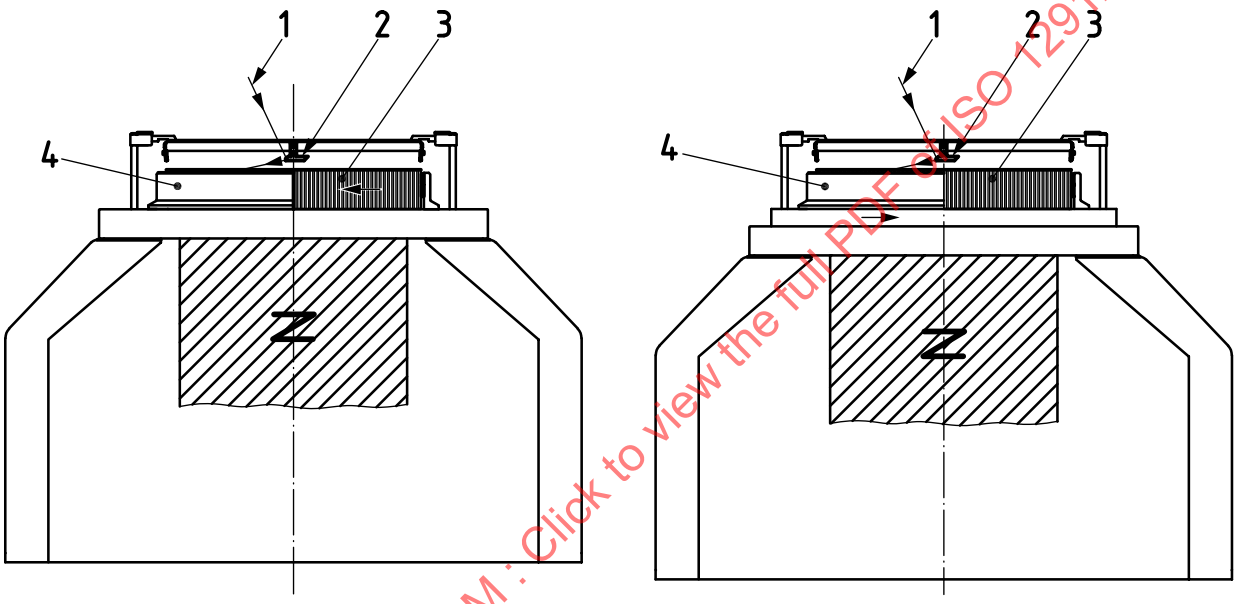
[SOURCE: ISO 11675:2005, 5.12]

2.4 Terms for rotation

2.4.1
direction of rotation
clockwise or anticlockwise rotation of the needle cylinder or cam casing from above

2.4.2
relative rotation
Z
clockwise rotation of needle cylinder [see Figure 7 a)] or anticlockwise rotation of the cam box [see Figure 7 b)] with the courses in the fabric forming a Z (right) spiral

Note 1 to entry: The fabric is observed from outside suspended in the machine.



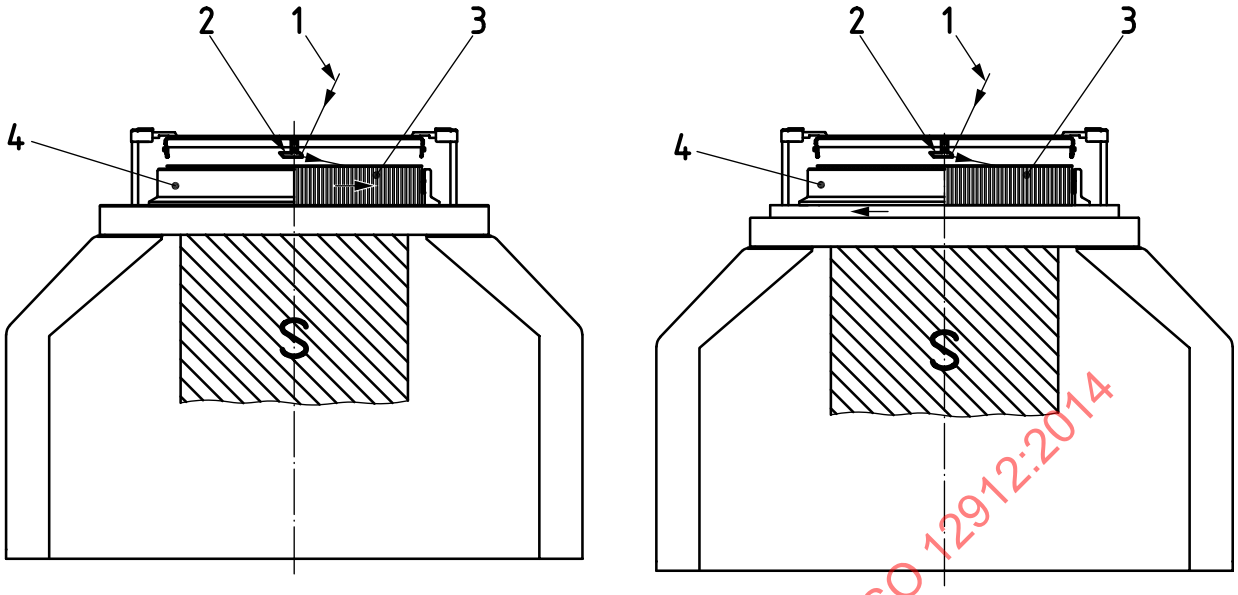
a) Clockwise rotation of needle cylinder **b) Anticlockwise rotation of the cam box**

Key
1 yarn
2 yarn guide
3 needle cylinder
4 cam box

Figure 7 — Relative rotation Z

2.4.3
relative rotation
S
anticlockwise rotation of needle cylinder [see Figure 8 a)] or clockwise rotation of the cam box [see Figure 8 b)] with the courses in the fabric forming an S (left) spiral

Note 1 to entry: The fabric is observed from outside suspended in the machine.



a) Anticlockwise rotation of needle cylinder **b) Clockwise rotation of the cam box**

Key

1 yarn
2 yarn guide
3 needle cylinder
4 cam box

Figure 8 — Relative rotation S

2.5 Machine frame and drive

2.5.1
machine frame
supporting framework which carries all the other machine assemblies

2.5.2
drive
one or more units for generating the movements necessary for the stitch forming procedure and controlling the machine

2.6 Stitch forming elements, holder for needles and other stitch forming elements

2.6.1
needle cylinder
cylindrical hollow components with external grooves in axial direction for receiving and guiding the stitch forming elements

Note 1 to entry: See Figure 1.

EXAMPLE Latch needles.

2.6.2
needle disc
dial
ring-shaped disc with grooves in radial direction for receiving and guiding the stitch forming elements

Note 1 to entry: See Figure 2.

EXAMPLE Latch needles.

2.6.3
sinker ring
ring groove running in a radial direction for receiving and guiding holding-down, knock-over, plush, transfer and other sinkers

Note 1 to entry: See Figure 1.

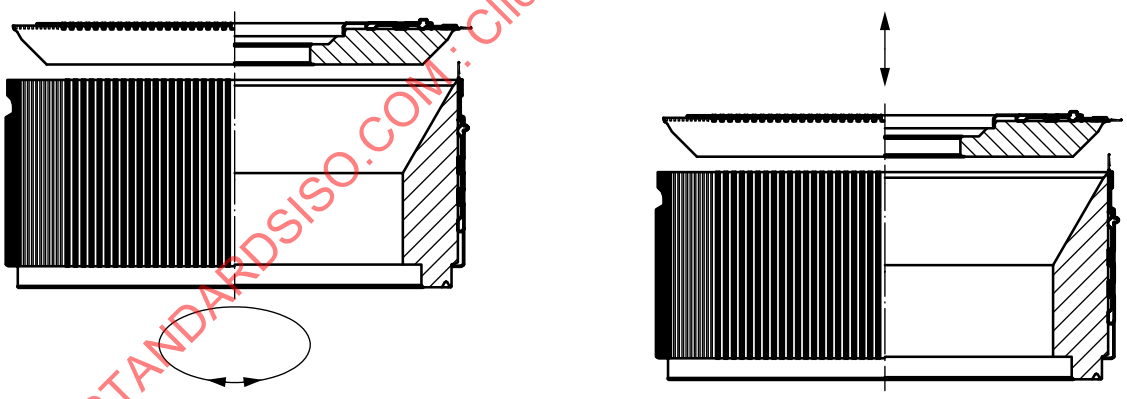
2.6.4
groove
guide machined into the holder

2.6.5
trick
part between two grooves of needle or sinker holder

2.6.6
knock-over comb
part of needle holder on which stitches are formed (knocked over)

2.6.7
adjusting unit
equipment for horizontal or vertical adjustment of the needle disc relative to the needle cylinder

Note 1 to entry: See Figure 9 a) and Figure 9 b).



a) Horizontal adjustment of the needle disc **b) Vertical adjustment of the needle disc**

Figure 9 — Adjustment of the needle disc

2.6.8
holding spring
unit for securing needles, needle slides and/or other auxiliary parts

2.6.9
needle
main stitch-forming element

[SOURCE: ISO 11675:2005, 8.12]

2.6.10
sinker for stitch forming
part for holding the yarn or structural elements during stitch forming process

2.6.10.1
holding down sinker
sinker which holds down the end of the fabric

[SOURCE: ISO 11675:2005, 8.14]

2.6.10.2
knock over sinker
sinker that knocks over the last stitch row in conjunction with the needle when guiding back the needle

2.6.10.3
other sinkers
plush sinker for forming the plush loop or fleece sinker for forming the fleece loop

2.7 Needle control

2.7.1
needle control elements
parts for moving and controlling the needles

2.7.2
needle selector
element for moving the needle

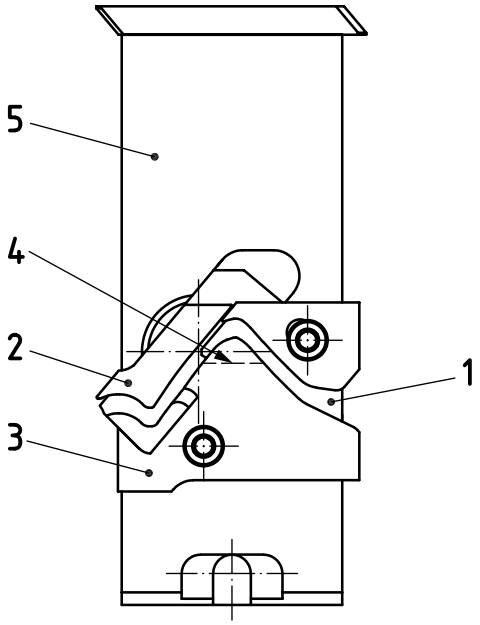
2.7.3
control sinker
sinker for supporting needle selection

2.8 Cam system

2.8.1
cam box
unit for controlling and moving needles, needle slides and/or other auxiliary parts

2.8.2
cylinder cam box
cam box for needles or auxiliary parts in the cylinder

Note 1 to entry: See Figure 10.



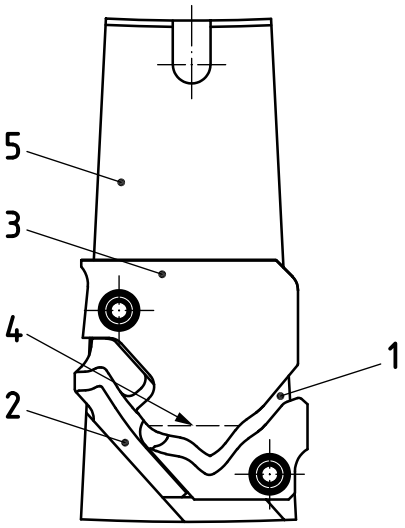
Key

1 knitting channel
2 take-down cam
3 raising cam for knitting
4 tuck clearance cam
5 segment

Figure 10 — Cylinder cam box

2.8.3
disk cam box
dial cam box
cam box for needles or auxiliary parts in the needle disc (dial)

Note 1 to entry: See Figure 11.



Key

1 knitting channel
2 take-down cam
3 raising cam for knitting
4 tuck clearance cam
5 segment

Figure 11 — Disc cam box

2.8.4
sinker cam box
equipment for controlling and moving sinkers

Note 1 to entry: See Figure 12.

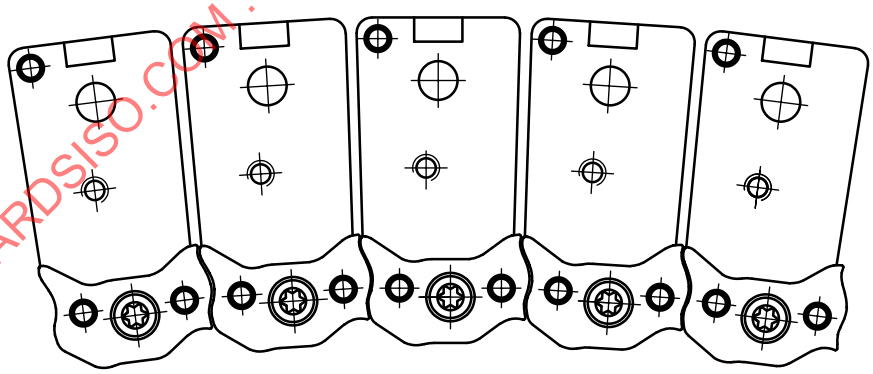


Figure 12 — Sinker cam box

2.8.5
cam plate
retaining plate for cams

2.8.6
cam box segment
part of cylinder, disc or sinker cam for receiving cams

2.8.7
knitting feeder
cam configuration with yarn guiding for producing a course or a sectional course

2.8.8
knitting clearance cam
cam for moving the needles, needle slides and other auxiliary parts into the knitting position

2.8.9
tuck clearance cam
cam for moving the needles, needle slides and other auxiliary parts into the tuck position

2.8.10
clearance cam
cam for guiding back the needles, needle slides and other auxiliary parts

2.8.11
transfer system
cam configuration without yarn guiding for transferring stitches within a stitch row

2.8.12
receiving clearance cam
cam for moving the needles, needle slides and other auxiliary parts into the receiving position when transferring stitches and loops

2.8.13
forwarding clearance cam
cam for moving the needles, needle slides and other auxiliary parts into the forwarding position when transferring stitches and loops

2.8.14
clearance cam for needle change
cam for moving needles from one needle cylinder to the other for purl fabrics

2.8.15
limiting cam
cam for limiting needle movement

2.8.16
single-part cam
cam with integrated needle butt for miss-knit, support, tuck or clearance, including guiding back of needles, needle slides or other auxiliary parts

Note 1 to entry: See Figure 13.

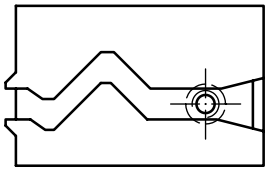


Figure 13 — Single part cam

2.8.17
knitting channel
guide track for butts of needles, needle slides and other auxiliary parts

2.9 Yarn feed and monitoring system

2.9.1
yarn feeding devices
unit for receiving, guiding and monitoring the yarn

2.9.2
bobbin holder unit
unit for holding the yarn bobbins

2.9.3
yarn guide and monitoring unit
unit for guiding and monitoring the yarn from the yarn bobbin to the yarn guide

2.9.4
knot catcher
unit for scanning the yarn for thread thickness

2.9.5
yarn detector
unit that deactivates the machine in the event of yarn breakage or fluctuating yarn tension force

2.9.6
yarn guide
part that feeds the yarn to the needles

2.9.7
yarn brake
passive unit for generating a particular yarn tension force

2.9.8
yarn feeder
device, positioned in the yarn path between bobbin and needles, for feeding and/or delivering yarn

Note 1 to entry: The term feeder here constitutes the technic generic term for yarn feeding devices/units.

[SOURCE: ISO 13990-1:2006, 1]

2.9.9
yarn recovery unit
unit for recovering excess yarn

2.10 Fabric take-down

2.10.1
fabric take-down and fabric collection units
units for tensioning and taking down of fabric

Note 1 to entry: See Figure 14.