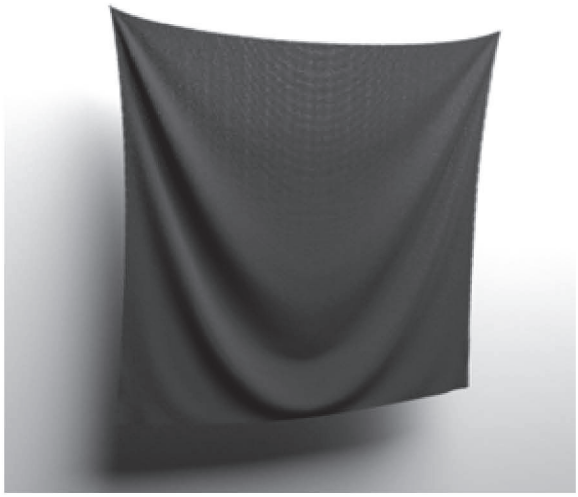

Fig. 1A

Fig. 1B

Fig. 1C

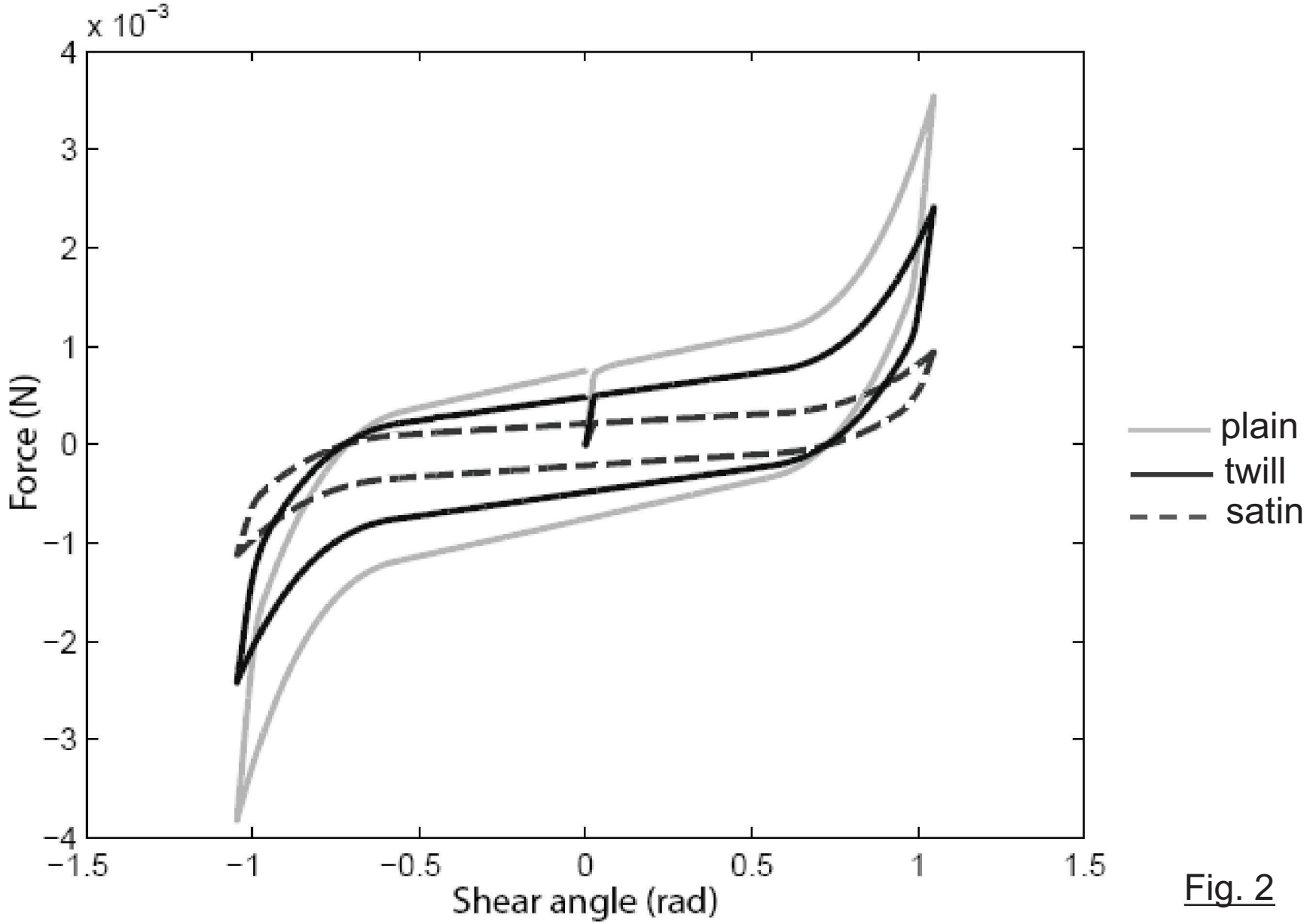
x 10^-3
4
3
2
1
0
−1
−2
−3
−4
Force (N)
−1.5
−1
−0.5
0
0.5
1
1.5
Shear angle (rad)
plain
twill
satin

Fig. 2

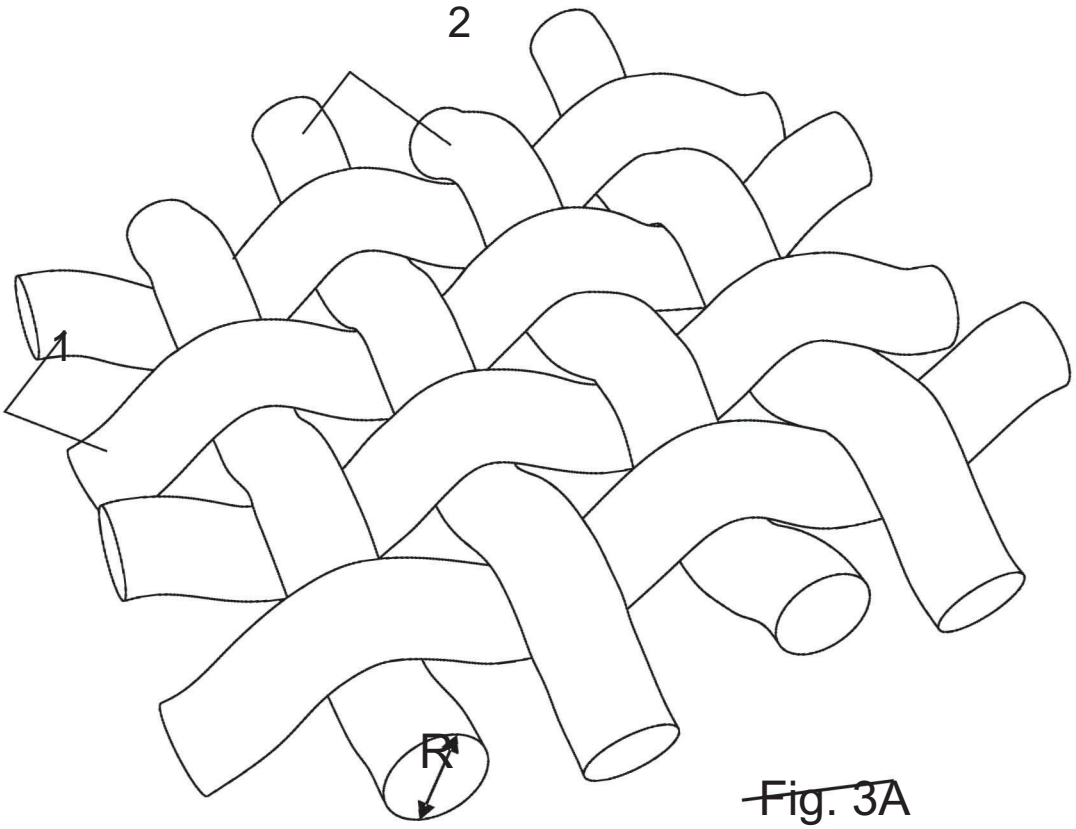

Fig. 3A

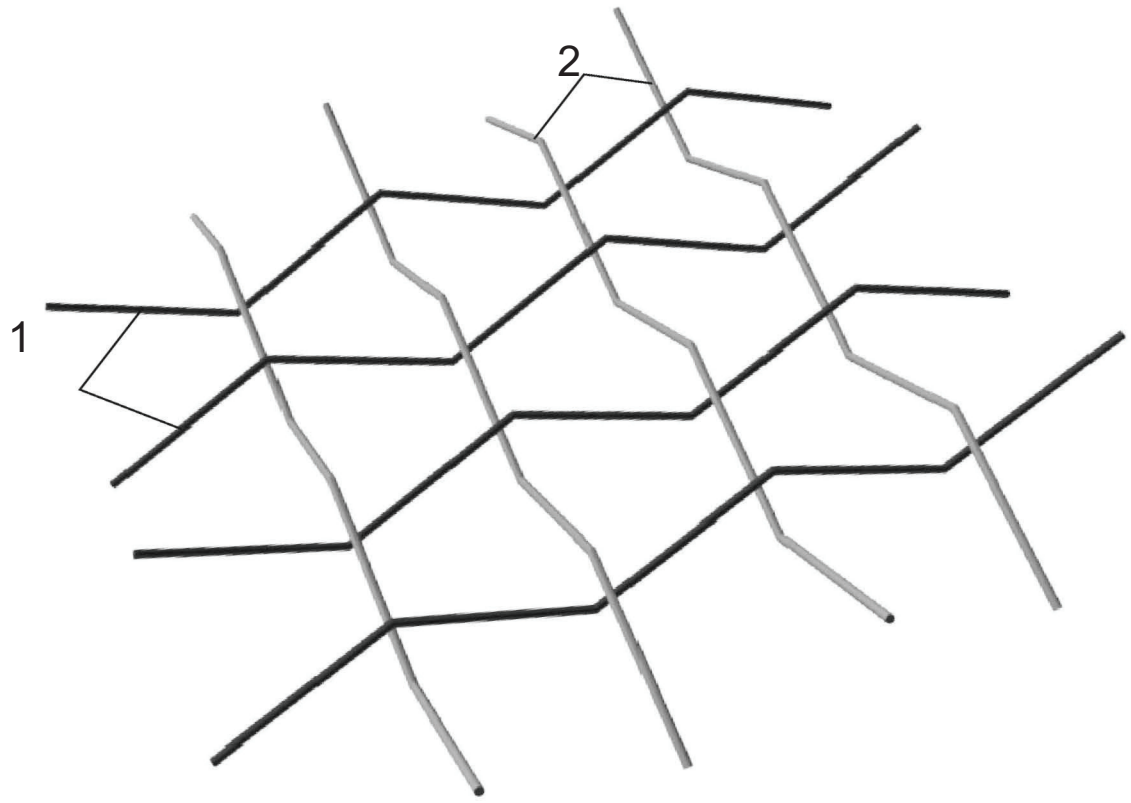

Fig. 3B

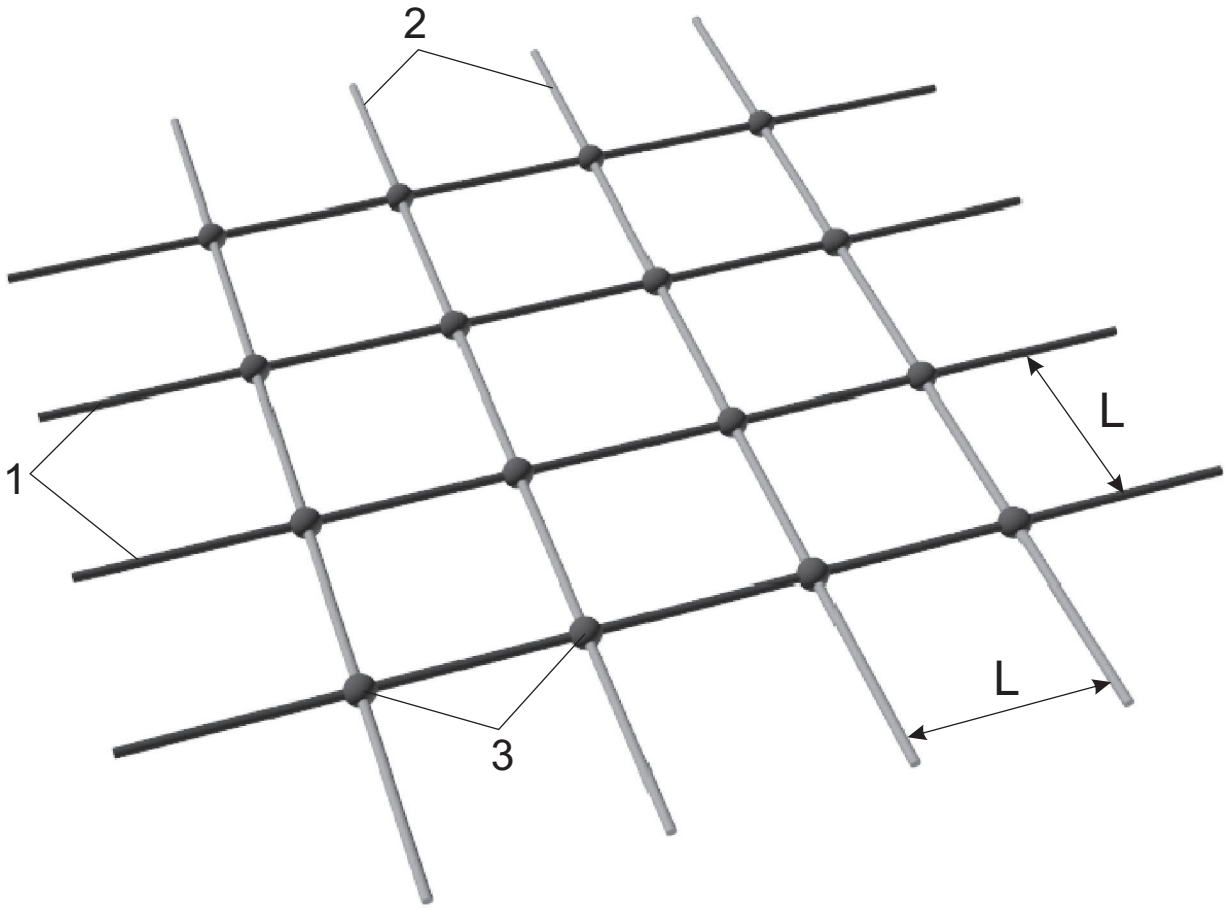

Fig. 3C

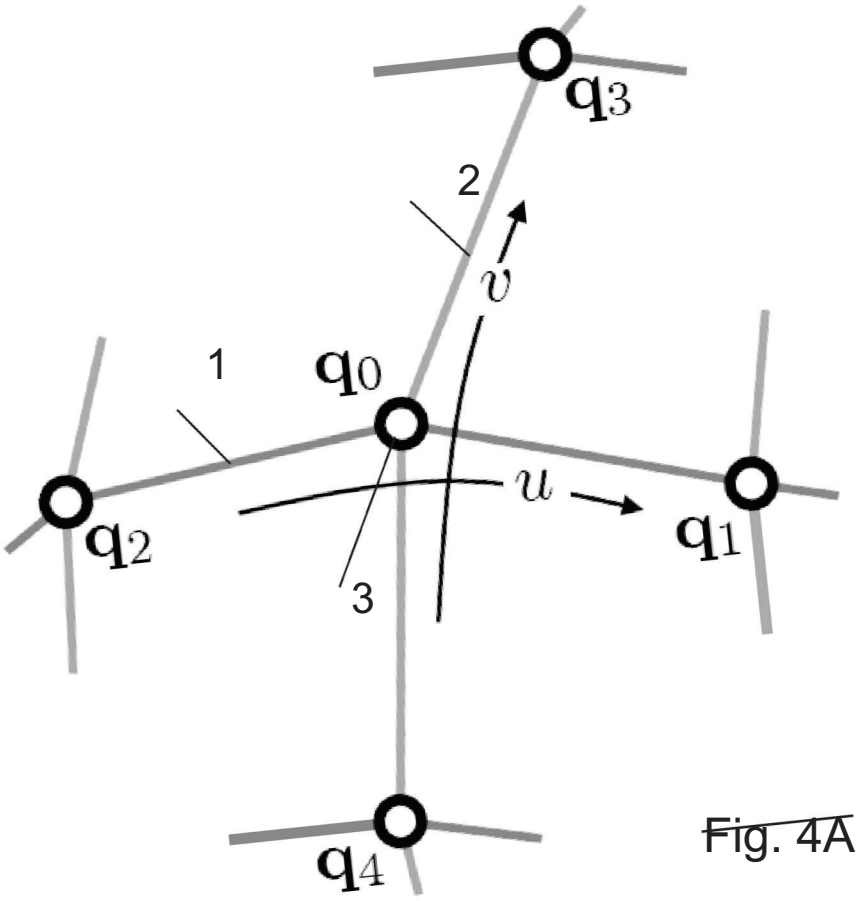
$\mathbf{q}_3$
2
v
1
$\mathbf{q}_0$
u
$\mathbf{q}_2$
$\mathbf{q}_1$
3
$\mathbf{q}_4$

Fig. 4A

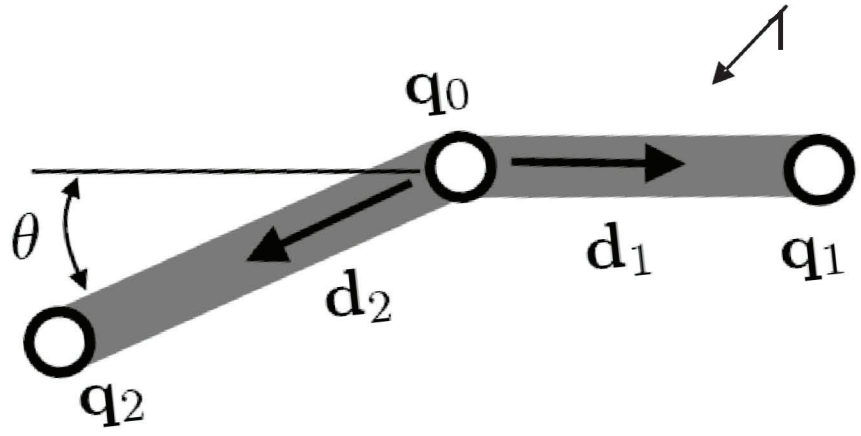
1
$\mathbf{q}_0$
θ
$\mathbf{d}_1$
$\mathbf{q}_1$
$\mathbf{d}_2$
$\mathbf{q}_2$

Fig. 4B

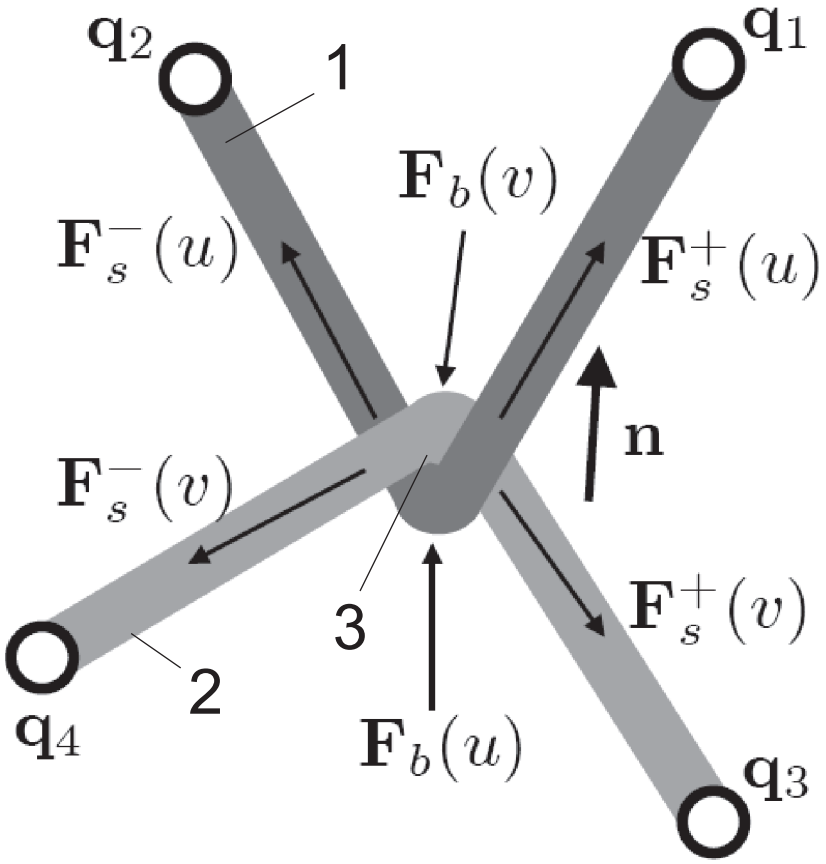
$\mathbf{q}_2$
1
$\mathbf{q}_1$
$\mathbf{F}_b(v)$
$\mathbf{F}_s^-(u)$
$\mathbf{F}_s^+(u)$
$\mathbf{n}$
$\mathbf{F}_s^-(v)$
3
$\mathbf{F}_s^+(v)$
2
$\mathbf{q}_4$
$\mathbf{F}_b(u)$
$\mathbf{q}_3$

Fig. 4C

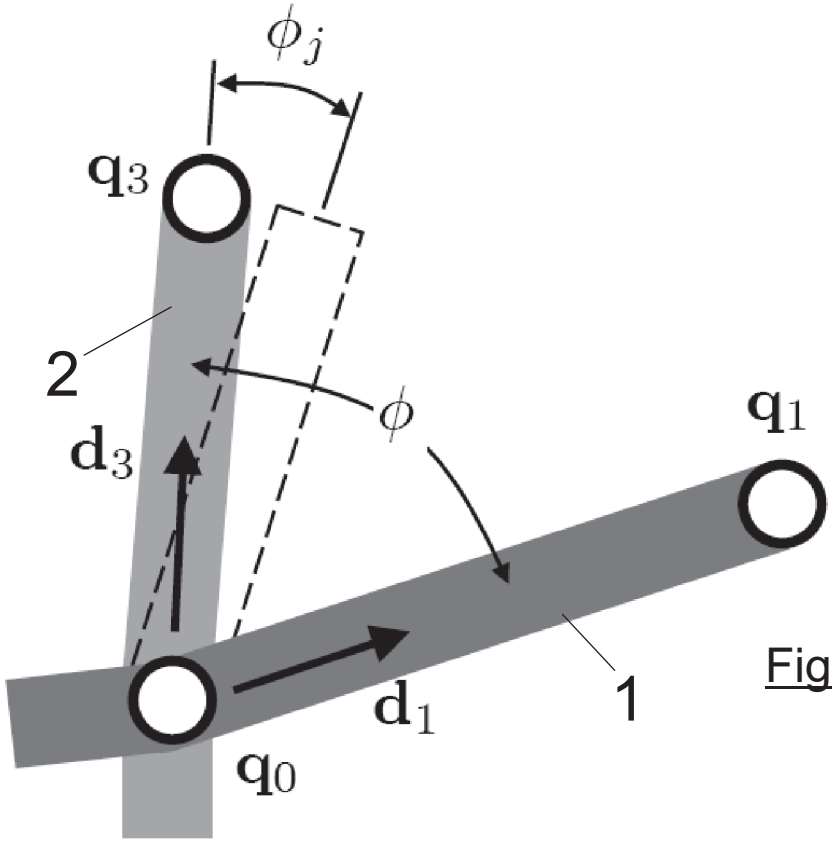
ϕ_j
$\mathbf{q}_3$
2
ϕ
$\mathbf{q}_1$
$\mathbf{d}_3$
$\mathbf{d}_1$
1
$\mathbf{q}_0$

Fig. 4D

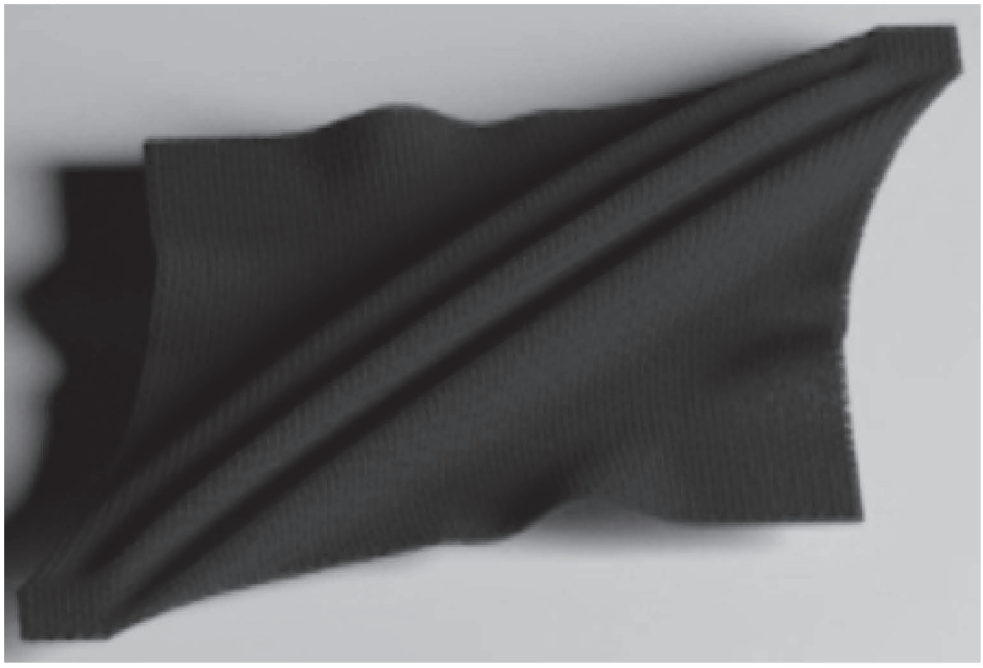

Fig. 5A

Fig. 5B

Example	Seg. length (mm)	Yarn radius (mm)	Elastic mod. (Pa)	Bending mod. (Pa)	Contact Shear mod. (Pa)	Sliding Fric. Coef.	α, β
Tank top (Fig. 6)	1	0.25	1e7	1e-2	1e4	0.3	10, 0.05
Long shirt (Fig. 8)	1	0.25	1e7	2e-2	1e4	0.3	20, 0.05
1M nodes sheet (Fig. 11)	0.254	0.06	1e7	1e-2	3e5	0.3	35, 0.01

Fig. 6

Example	Collisions	Forces	Jacobians	Solver
Tank top	322	28	280	2513
Long shirt	519	34	365	4033
1M nodes sheet	803	35	385	930

Fig. 7

Fig. 8

Fig. 9

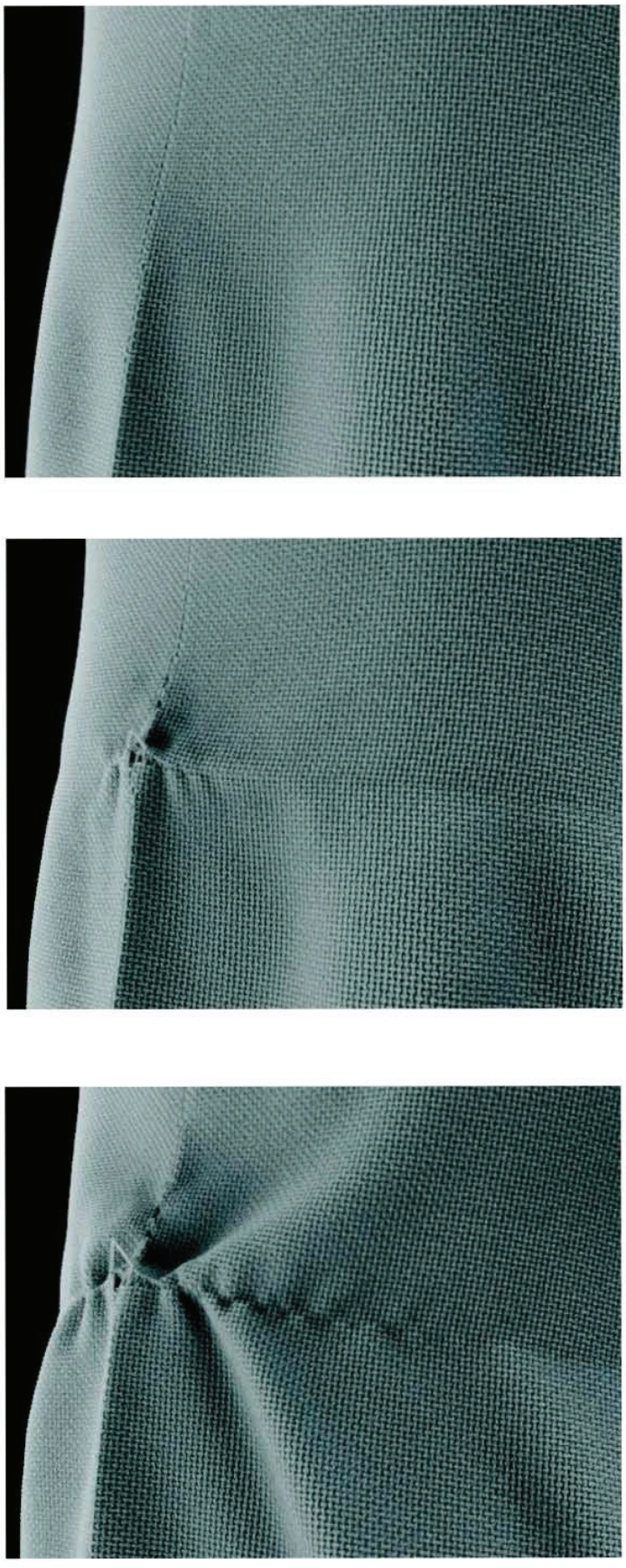

Fig. 10

Fig. 11A

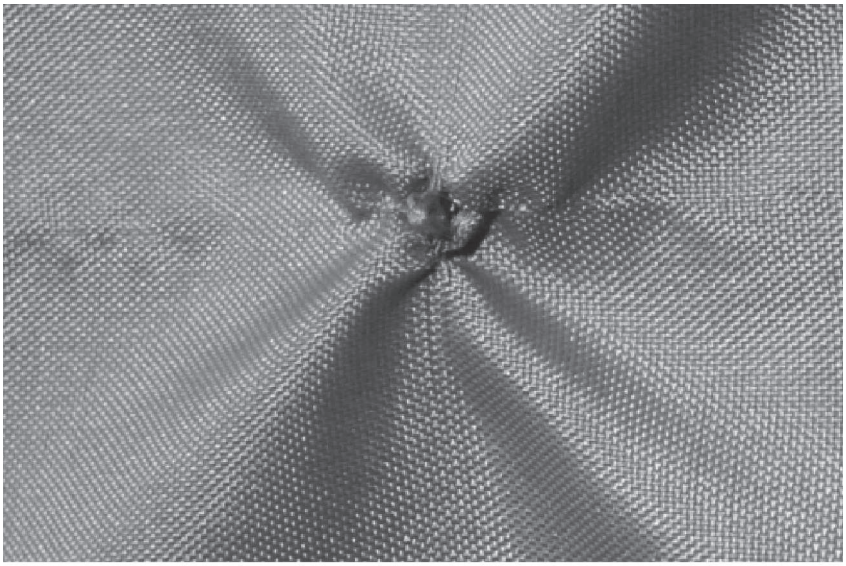

Fig. 11B

Fig. 11C

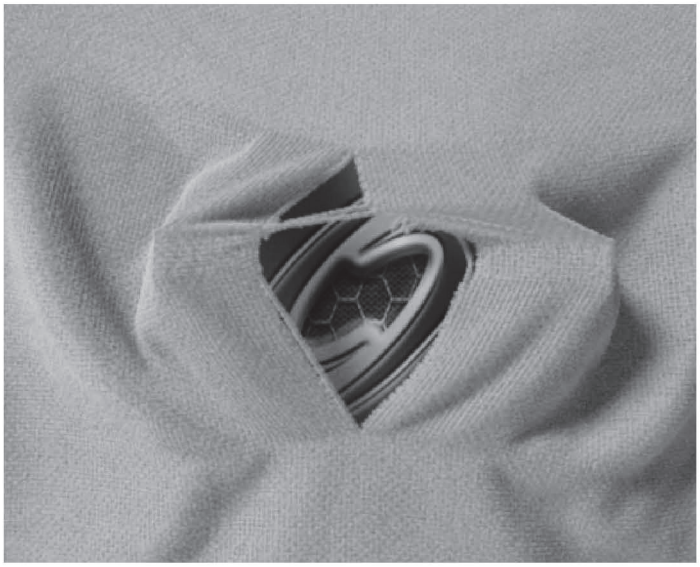

Fig. 12

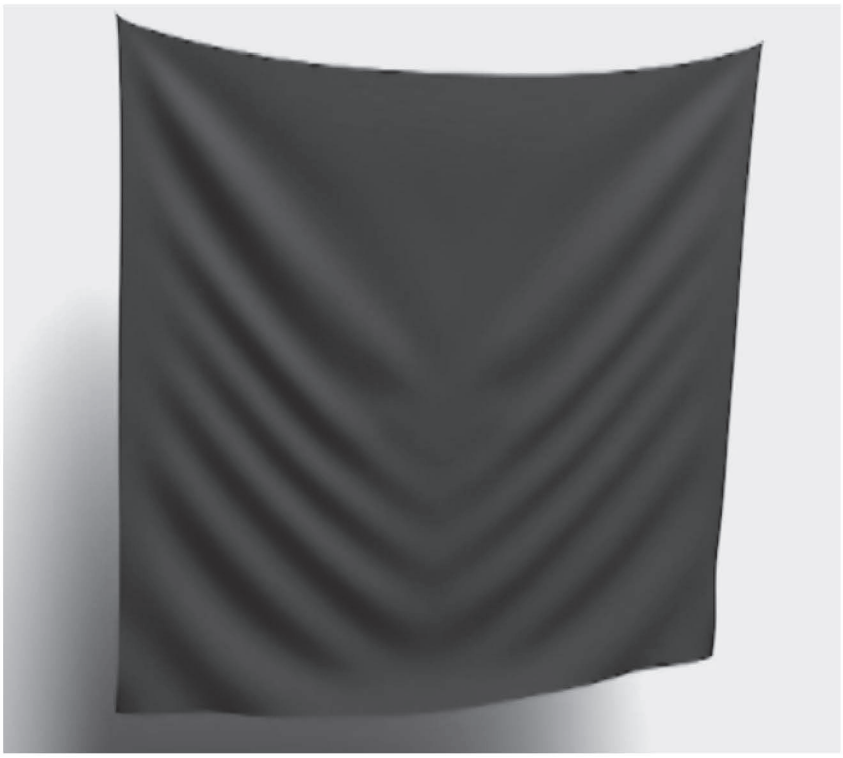

Fig. 13A

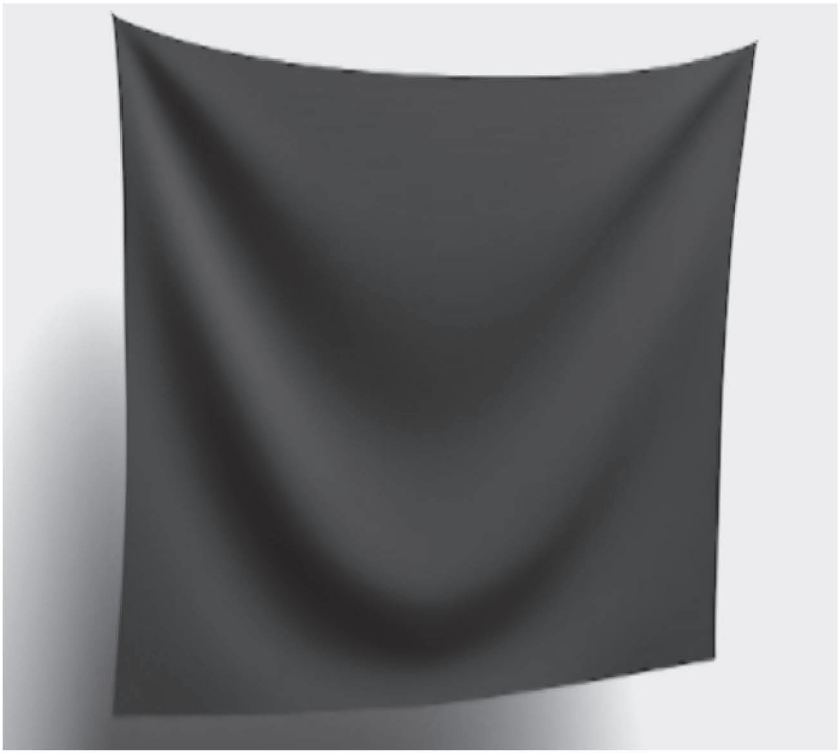

Fig. 13B