Fig.1

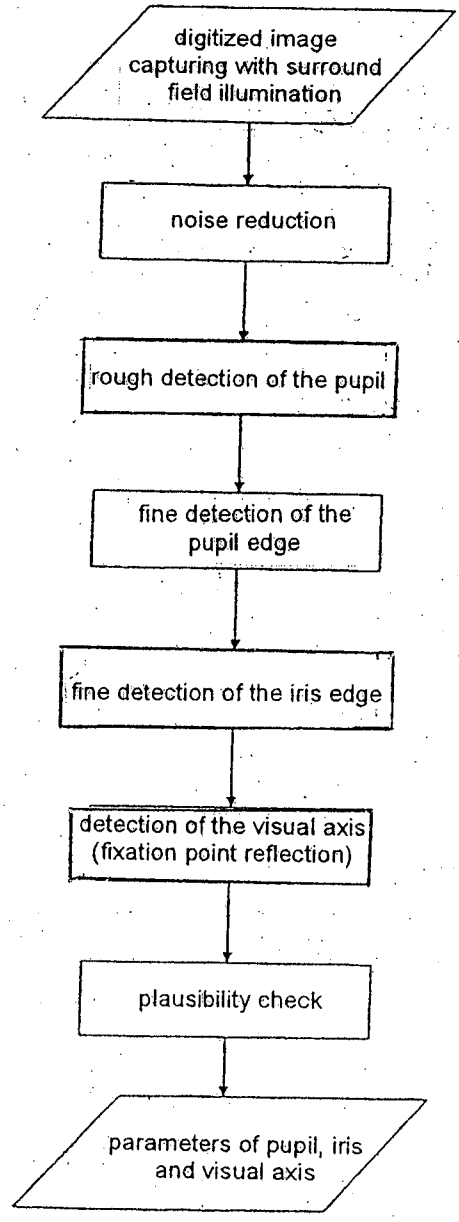

digitized image capturing with surround field illumination
noise reduction
rough detection of the pupil
fine detection of the pupil edge
fine detection of the iris edge
detection of the visual axis (fixation point reflection)
plausibility check
parameters of pupil, iris and visual axis

Fig.2

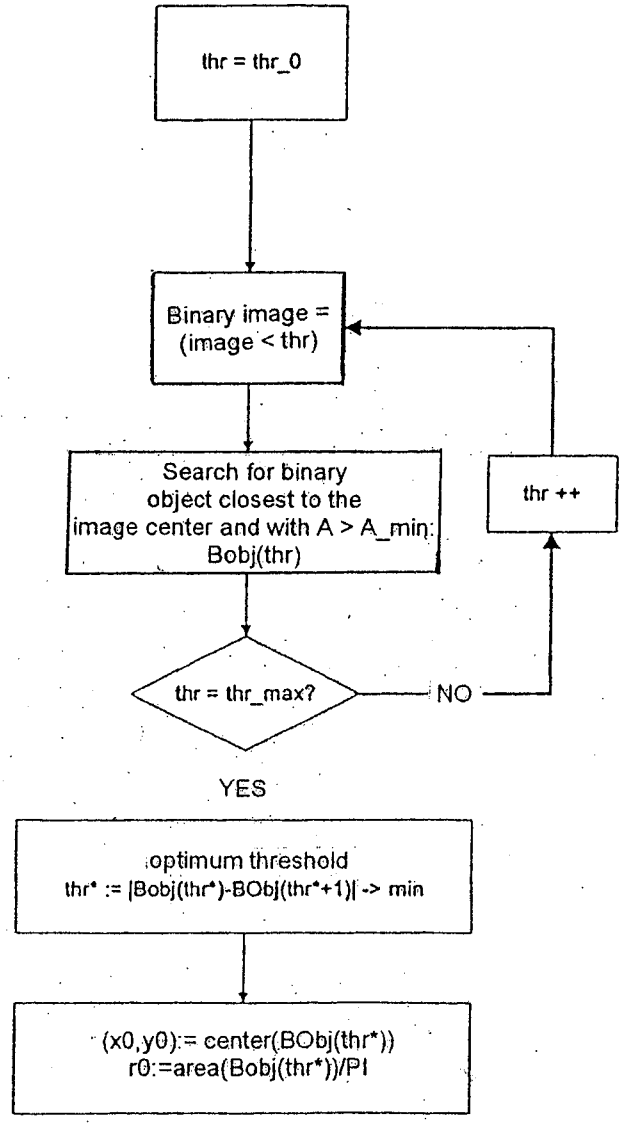

thr = thr_0
Binary image = (image < thr)
Search for binary object closest to the image center and with A > A_min: Bobj(thr)
thr ++
thr = thr_max?
NO
YES
optimum threshold
thr* := |Bobj(thr*)-BObj(thr*+1)| -> min
(x0,y0):= center(BObj(thr*))
r0:=area(Bobj(thr*))/PI

Fig.3

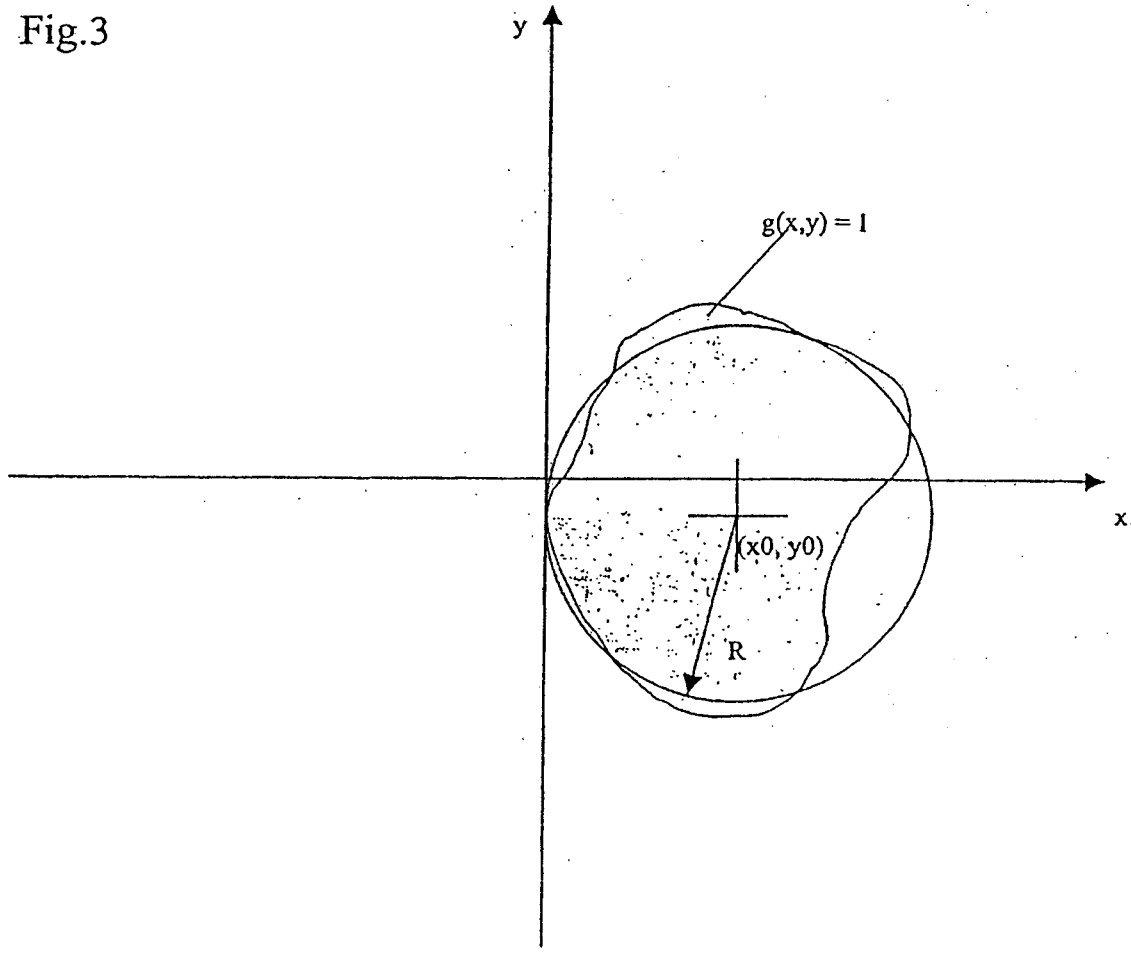


Fig.4

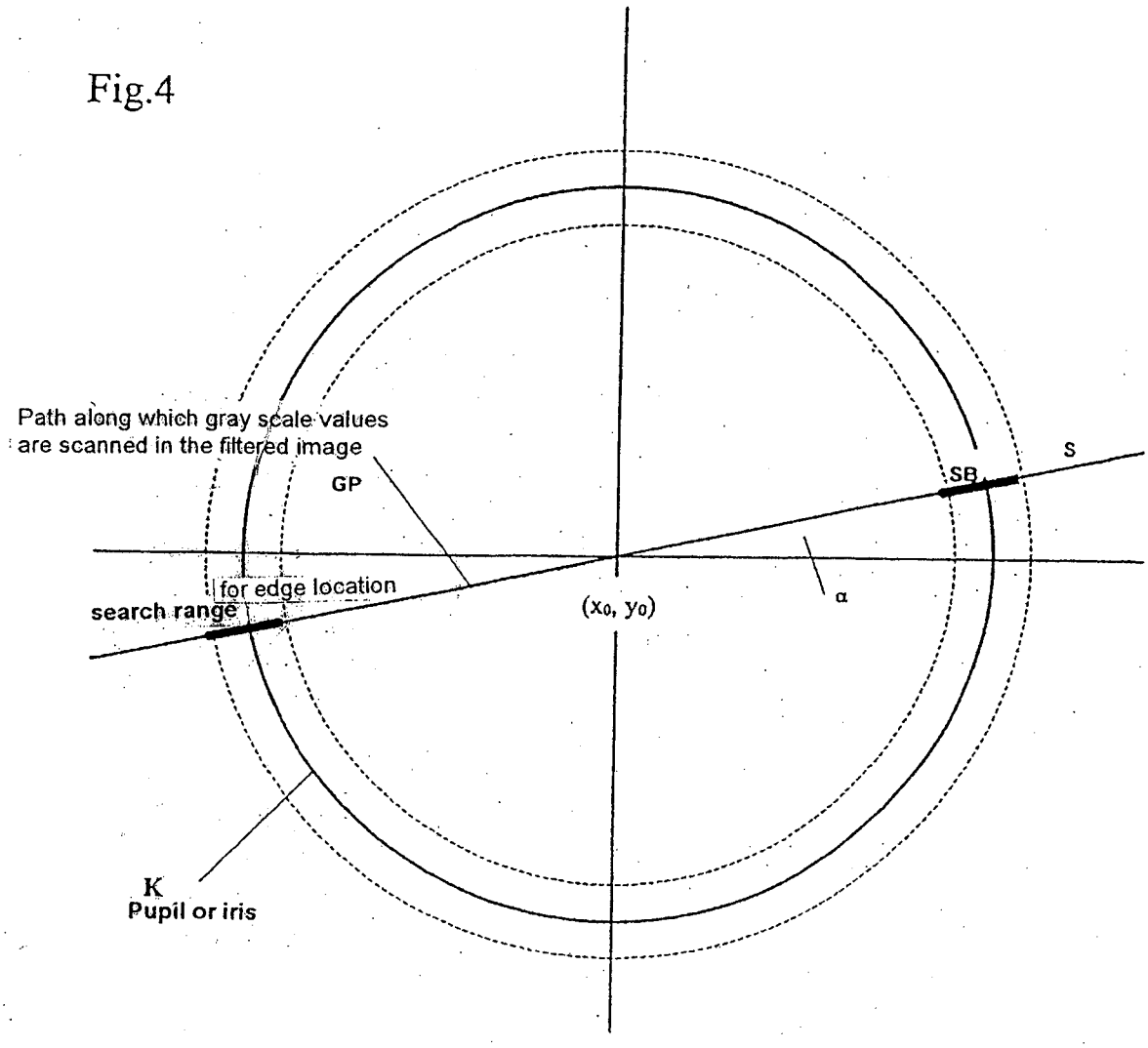

Path along which gray scale values
are scanned in the filtered image
GP
S
SB
for edge location
search range
(x0, y0)
α
K
Pupil or iris

Fig.5

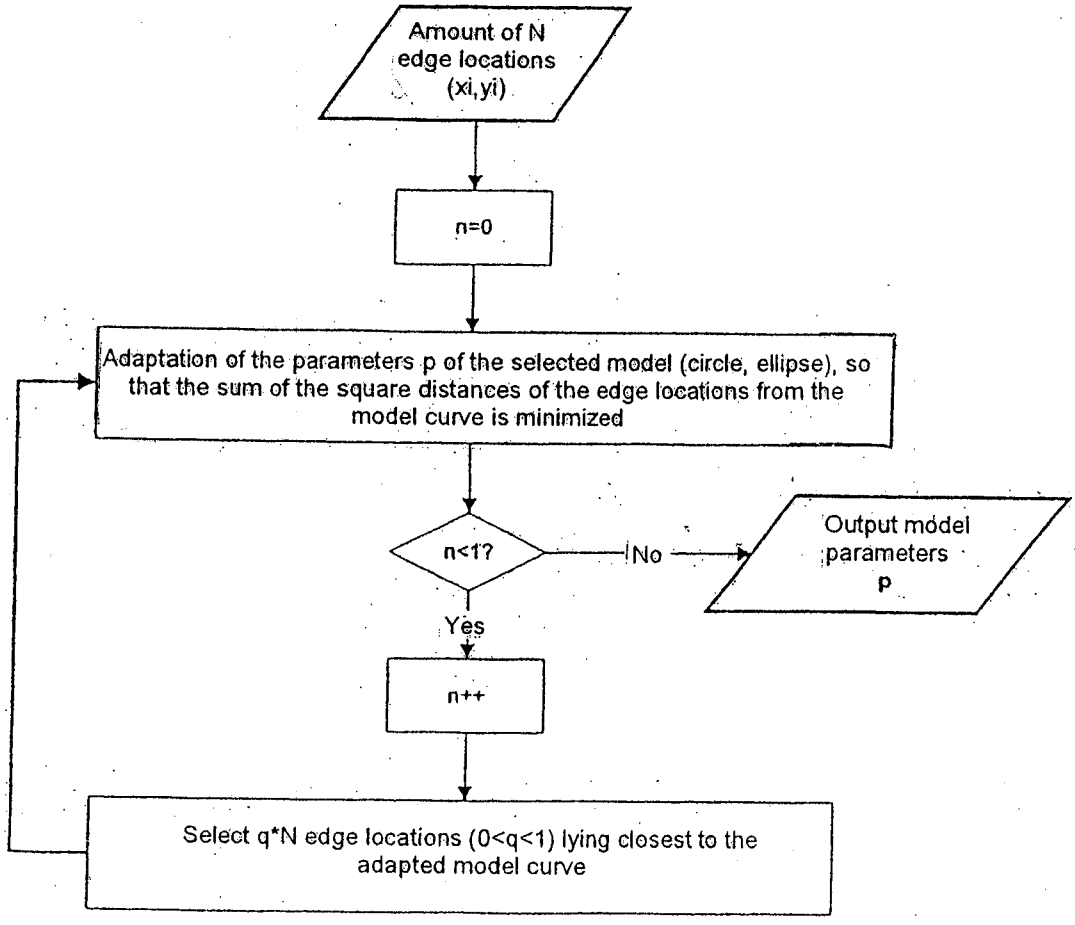

Amount of N edge locations (xi,yi)
n=0
Adaptation of the parameters p of the selected model (circle, ellipse), so that the sum of the square distances of the edge locations from the model curve is minimized
n<1?
No
Output model parameters p
Yes
n++
Select q*N edge locations (0<q<1) lying closest to the adapted model curve

Fig.6

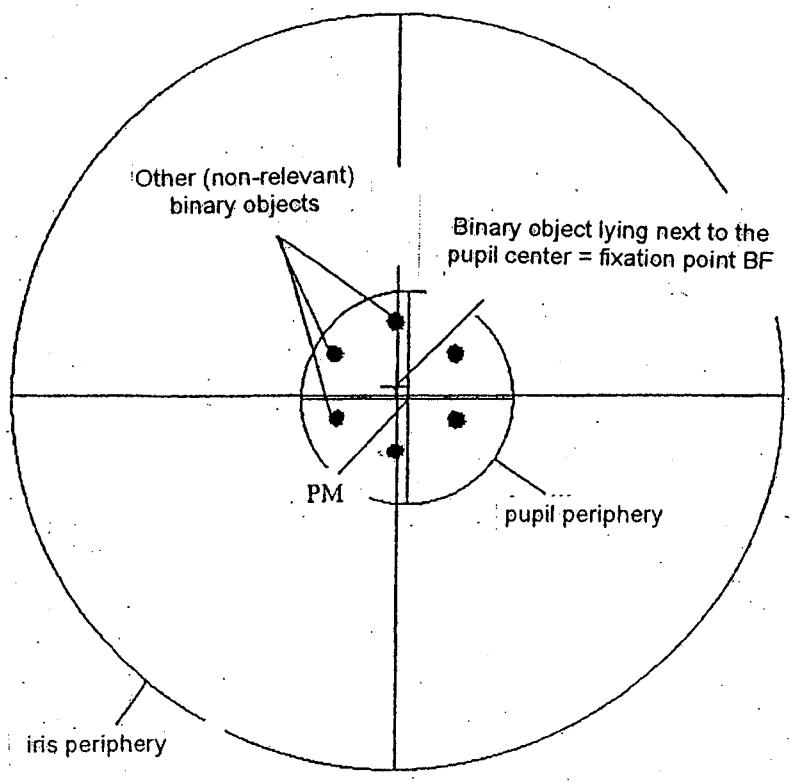
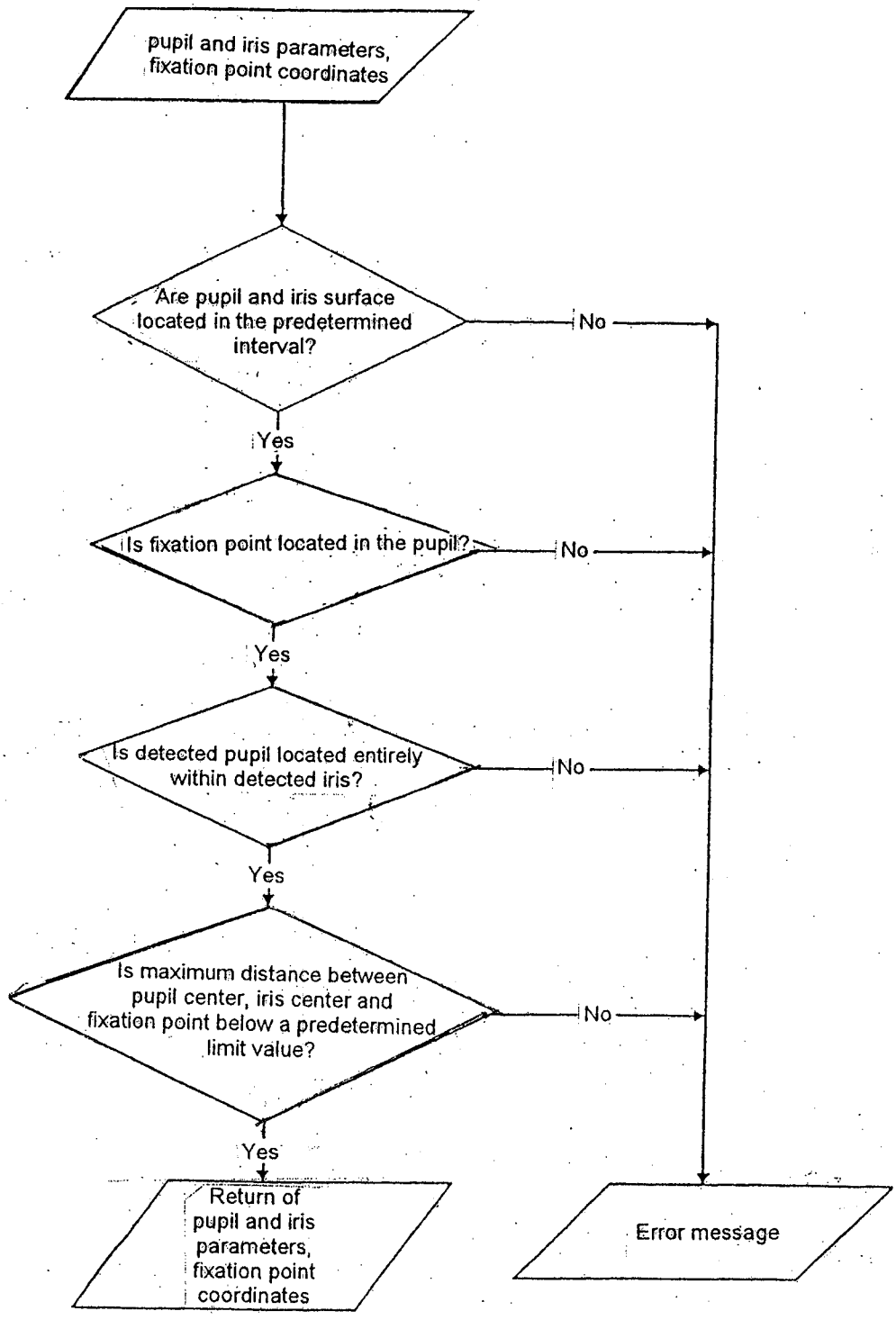

Other (non-relevant)
binary objects
Binary object lying next to the
pupil center = fixation point BF
PM
pupil periphery
iris periphery

Fig.7


pupil and iris parameters, fixation point coordinates
Are pupil and iris surface located in the predetermined interval?
No
Yes
Is fixation point located in the pupil?
No
Yes
Is detected pupil located entirely within detected iris?
No
Yes
Is maximum distance between pupil center, iris center and fixation point below a predetermined limit value?
No
Yes
Return of pupil and iris parameters, fixation point coordinates
Error message

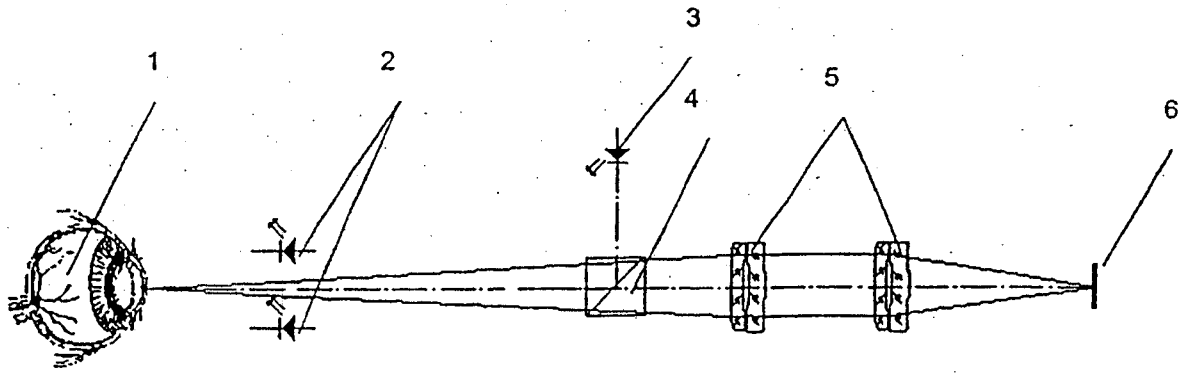


Fig. 8 schematic representation of the arrangement according to the invention

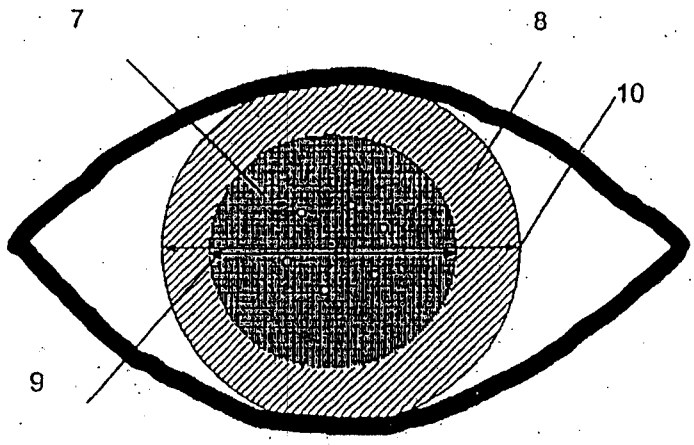


Fig. 9 grabbed image of an eye to be measured

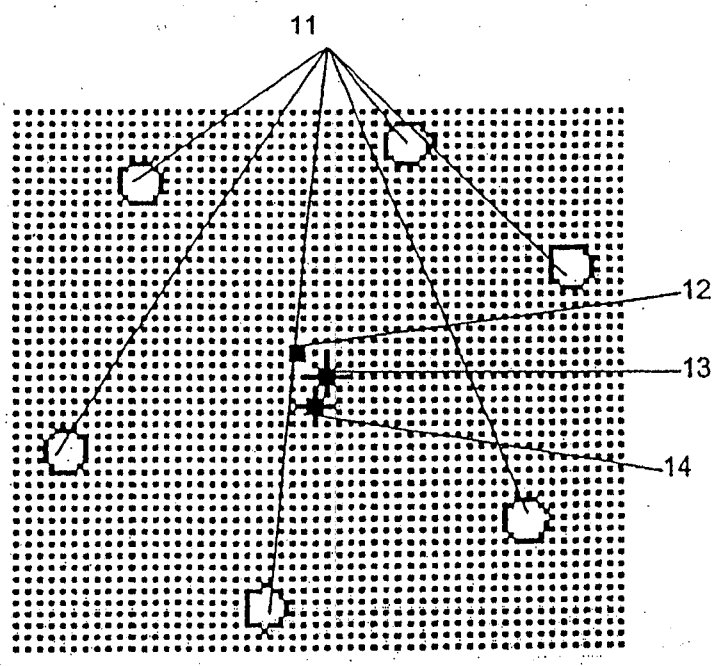


Fig. 10 enlargement of central part of Fig. 9

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Fig. 11 White-to-white gauge according to Holladay-Godwin:
AE-1576 Holladay-Godwin
Cornea Gauge

