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United States Patent [19]

[11] Patent Number: **5,508,821**

Murata

[45] Date of Patent: **Apr. 16, 1996**

[54] **IMAGE SCANNER AND IMAGE FORMING APPARATUS WITH AN INTERFACE FOR CONNECTION WITH AN EXTERNAL COMPUTER**

| | | | |
|-----------|---------|-----------------|---------|
| 4,896,262 | 1/1990 | Wayama et al. | 395/500 |
| 4,958,315 | 9/1990 | Balch | 395/500 |
| 4,975,829 | 12/1990 | Clarey et al. | 364/500 |
| 5,088,033 | 2/1992 | Binkley et al. | 395/500 |
| 5,131,089 | 7/1992 | Cole | 395/500 |
| 5,157,384 | 10/1992 | Greanias et al. | 345/156 |

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[73] Assignee: **Matsushita Electric Industrial Co., Ltd.**, Kadoma, Japan

OTHER PUBLICATIONS

Operating Systems: Design and Implementation, Andrew S. Tanenbaum, 1987, pp. 299-308.

[21] Appl. No.: **36,028**

[22] Filed: **Mar. 23, 1993**

[30] Foreign Application Priority Data

| | | | |
|--------------|------|-------|----------|
| Apr. 9, 1992 | [JP] | Japan | 4-88541 |
| Aug. 7, 1992 | [JP] | Japan | 4-211102 |

Primary Examiner—Scott A. Rogers
Attorney, Agent, or Firm—Ratner & Prestia

[51] **Int. Cl.⁶** **H04N 1/00**; H04N 1/21; G06F 3/00; G06F 9/455; G06F 13/00

[57] ABSTRACT

[52] **U.S. Cl.** **358/442**; 358/444; 358/471; 395/500; 395/828; 395/830; 395/882; 395/883; 395/892

An image scanner is occasionally used with an external host computer and includes an optical system and a CCD image sensor for reading an image of a document placed on a document platform. The image scanner further includes a small computer system interface (SCSI) for connecting the image scanner to the external host apparatus, and a CPU, a nonvolatile memory, an SCSI controller etc. for emulating a file system contained in the external host computer.

[58] **Field of Search** 358/471, 452, 358/474; 395/500, 275, 444, 468, 828, 830, 882, 883, 892

[56] References Cited

U.S. PATENT DOCUMENTS

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| 4,855,905 | 8/1989 | Estrada et al. | 364/500 |
|-----------|--------|----------------|---------|

10 Claims, 7 Drawing Sheets

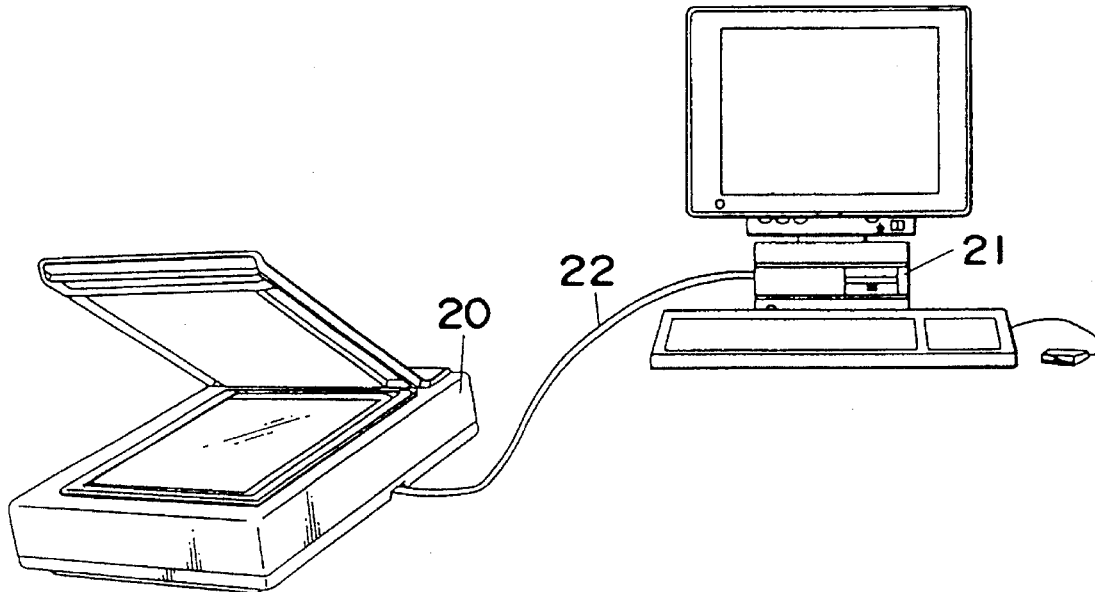


Fig. 1

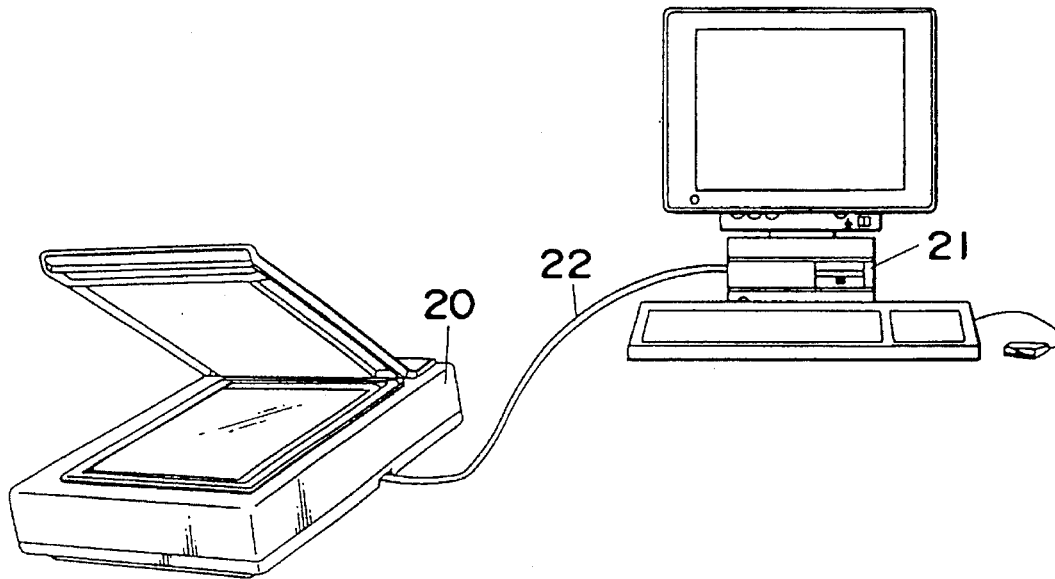
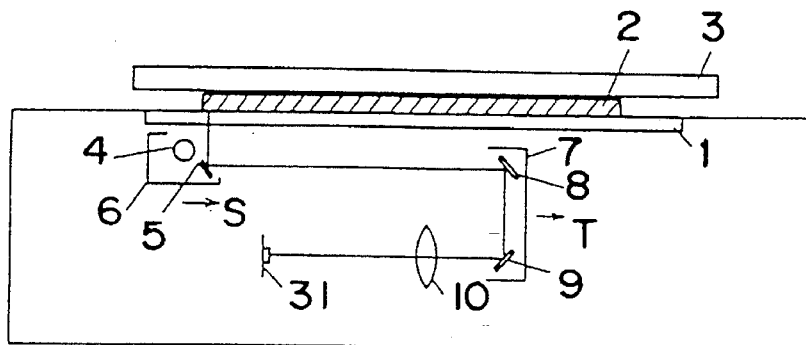


Fig. 2



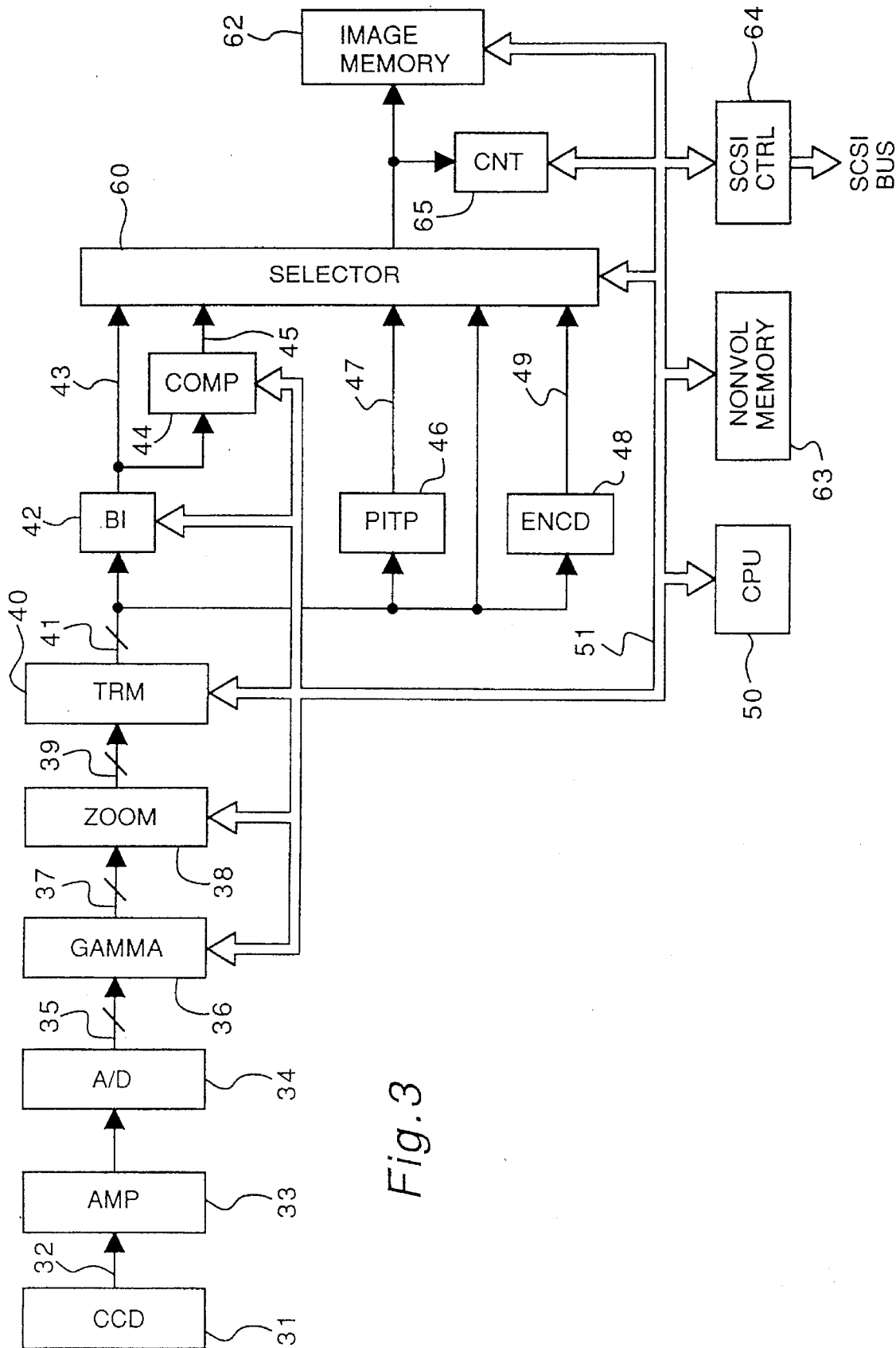


Fig. 3

Fig.4

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#SCANNER PARAMETER FILE EXAMPLE
# AREA PARAMETER(inch)
# X,Y,XL,YL
1.2
2.4
5.5
6.3
#ZOOMING PARAMETER(%) XZ,YZ
100
150

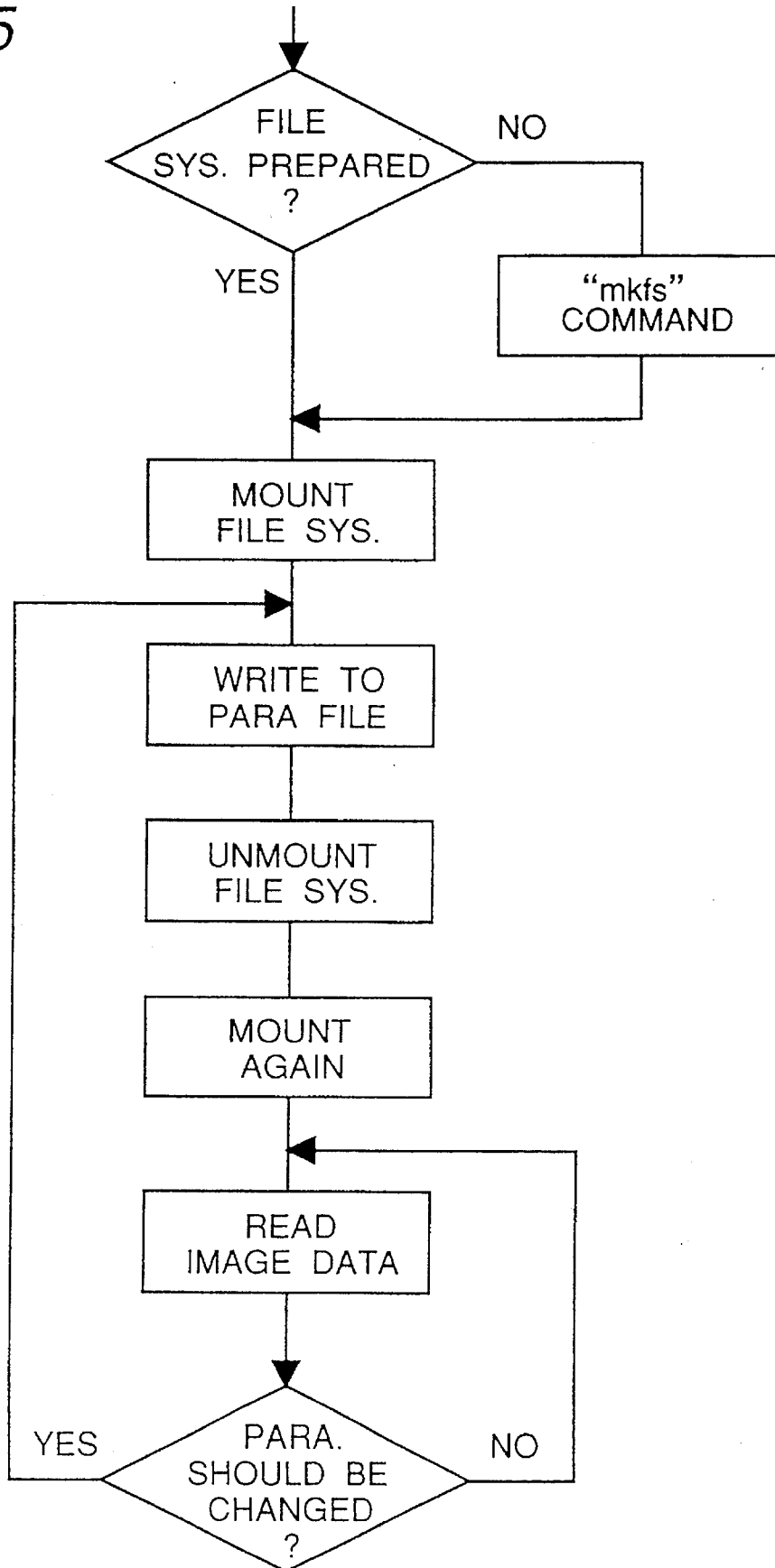
#IMAGE PROCESSING PARAMETER
#     SIMPLE BI-LEVEL IMAGE           ->0
#     BI-LEVEL COMPRESSION IMAGE(MH)  ->1
#     BI-LEVEL COMPRESSION IMAGE(MR)  ->2
#     BI-LEVEL COMPRESSION IMAGE(MMR) ->3
#     ERROR DIFFUSION BI-LEVEL IMAGE  ->4
#     88ITS GRAY SCALE IMAGE          ->5
#     88ITS GRAY SCALE COMPRESSION IMAGE ->6
1

#GAMMA TRANSFER PARAMETER
#     LINEAR           ->0
#     DENSITY         ->1
#     DATE SETTABLE   ->2
2

#GAMMA TRANSFER DATA TABLE
#DATA MUST BE 0 (<=.255) =
00 10 17 1C 20 24 27 2A 20 30 32 35 37 3A 3C 3E
40 42 44 46 47 49 4B 4D 4E 50 51 53 54 56 57 59
5A 5C 5D 5E 60 61 62 64 65 66 67 69 6A 6B 6C 6D
6F 70 71 72 73 74 75 76 77 79 7A 7B 7C 7D 7E 7F
80 81 82 83 84 85 86 87 87 88 89 8A 8B 8C 8D 8E
8F 90 91 91 92 93 94 95 96 97 97 98 99 9A 9B 9C
9C 9D 9E 9F A0 A0 A1 A2 A3 A4 A4 A5 A6 A7 A7 A8
A9 AA AA AB AC AD AD AE AF B0 B0 B1 B2 B3 B3 B4
B5 B5 B6 B7 B7 B8 B9 BA BA BB BC BC BD BE BE BF
C0 C0 C1 C2 C2 C3 C4 C4 C5 C6 C6 C7 C7 C8 C9 C9
CA CB CB CC CC CD CE CE CF D0 D0 D1 D1 D2 D3 D3
D4 D4 D5 D6 D6 D7 D7 D8 D9 D9 DA DA DB DC DC DD
DD DE DE DF E0 E0 E1 E1 E2 E2 E3 E4 E4 E5 E5 E6
E6 E7 E7 E8 E9 E9 EA EA EB EB EC EC ED ED EE EE
EF F0 F0 F1 F1 F2 F2 F3 F3 F4 F4 F5 F5 F6 F6 F7
F7 F8 F8 F9 F9 FA FA FB FB FC FC FD FD FE FE FF

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Fig.5



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