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FILE HISTORY

US 6,332,183

PATENT: 6,332,183

INVENTORS: Weber, Richard
Larsen, Corey

TITLE: Method for recovery of useful areas of
partially defective synchronous memory
components

APPLICATION NO: US199835739A

FILED: 05 MAR 1998

ISSUED: 18 DEC 2001

COMPILED: 14 JUN 2016

JG557 U.S. PTO

09/035739



03/05/98

74	Class	ISSUE CLASSIFICATION
170	Subclass	

PATENT NUMBER
6332183
6332183

U.S. UTILITY PATENT APPLICATION

O.I.P.E.	PATENT DATE
SCANNED _____ O.A. _____	DEC. 18 2000

SECTOR	CLASS	SUBCLASS	ART UNIT	EXAMINER
	711	170	275	Ellis Chan

FILED WITH: DISK (CRF) FICHE
(Attached in pocket on right inside flap)

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PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION			
ORIGINAL		CROSS REFERENCE(S)	
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)
711	170	711	154
INTERNATIONAL CLASSIFICATION			
G 06 F	12	02	
G 06 F	11	00	

Continued on Issue Slip inside File Jacket

<input type="checkbox"/> TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drawn	Figs. Drawn	Print Figs.	Total Claims	Print Claim for O.G.
	637	733	4	12	1
<input type="checkbox"/> a) The term of this patent subsequent to _____ (date) has been disclaimed.	_____ (Assistant Examiner)			NOTICE OF ALLOWANCE MAILED	
	Kevin L. Ellis (Primary Examiner)			04-24-01 4/30/01	
<input type="checkbox"/> b) The term of this patent shall not extend beyond the expiration date of U.S. Patent No. _____	Kevin L. Ellis (Primary Examiner)			ISSUE FEE (w)	
	Kevin L. Ellis (Primary Examiner)			Amount Due \$210.00	Date Paid 7-25-01
<input type="checkbox"/> c) The terminal _____ months of this patent have been disclaimed.	Lipson 04/27/01 (Legal Instruments Examiner)			ISSUE BATCH NUMBER	
				F36	

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Form PTO-436A (Rev. 10/97)

Frontal Drawings (sheets) set

B. PHOENIX
QUERY
ISSUE

(LABEL AREA)

(FACE)

6,332,183

METHOD FOR RECOVERY OF USEFUL AREAS OF PARTIALLY DEFECTIVE SYNCHRONOUS MEMORY COMPONENTS

Transaction History

Date	Transaction Description
03-11-1998	Initial Exam Team nn
06-12-1998	Notice Mailed--Application Incomplete--Filing Date Assigned
08-25-1998	Application Is Now Complete
09-28-1998	Preexamination Location Change
10-22-1998	Case Docketed to Examiner in GAU
11-02-1998	Information Disclosure Statement (IDS) Filed
11-02-1998	Information Disclosure Statement (IDS) Filed
10-25-1999	Non-Final Rejection
10-26-1999	Mail Non-Final Rejection
01-03-2000	Information Disclosure Statement (IDS) Filed
01-03-2000	Information Disclosure Statement (IDS) Filed
01-31-2000	Response after Non-Final Action
02-04-2000	Date Forwarded to Examiner
04-03-2000	Final Rejection
04-04-2000	Mail Final Rejection (PTOL - 326)
08-10-2000	Workflow - Request for CPA - Finish
08-10-2000	Workflow - Request for CPA - Begin
08-10-2000	Supplemental Papers - Oath or Declaration
08-10-2000	Continuing Prosecution Application - Continuation (ACPA)
08-10-2000	Mail Express Abandonment (During Examination)
08-10-2000	Express Abandonment (during Examination)
08-10-2000	Request for Extension of Time - Granted
08-11-2000	Change in Power of Attorney (May Include Associate POA)
08-11-2000	Correspondence Address Change
08-11-2000	Change in Power of Attorney (May Include Associate POA)
08-16-2000	Date Forwarded to Examiner
09-06-2000	Non-Final Rejection
09-07-2000	Mail Non-Final Rejection
09-08-2000	Information Disclosure Statement (IDS) Filed
09-08-2000	Information Disclosure Statement (IDS) Filed
09-11-2000	Information Disclosure Statement (IDS) Filed
09-11-2000	Information Disclosure Statement (IDS) Filed
10-06-2000	Case Docketed to Examiner in GAU
02-08-2001	Response after Non-Final Action
02-08-2001	Affidavit(s) (Rule 131 or 132) or Exhibit(s) Received
02-08-2001	Request for Extension of Time - Granted
02-15-2001	Date Forwarded to Examiner
04-24-2001	Mail Notice of Allowance
04-24-2001	Notice of Allowance Data Verification Completed
05-10-2001	Workflow - File Sent to Contractor
07-20-2001	Information Disclosure Statement (IDS) Filed
07-20-2001	Information Disclosure Statement (IDS) Filed
07-20-2001	Workflow - Informational Disclosure Statement - Finish
07-20-2001	Workflow - Informational Disclosure Statement - Begin
07-20-2001	Workflow - Customer Service Request - Finish
07-20-2001	Workflow - Customer Service Request - Begin
07-25-2001	Issue Fee Payment Verified
07-25-2001	Workflow - Drawings Finished
07-25-2001	Workflow - Drawings Matched with File at Contractor
07-25-2001	New or Additional Drawing Filed
07-25-2001	Workflow - Drawings Received at Contractor

07-25-2001	Workflow - Drawings Sent to Contractor
10-02-2001	Mail Miscellaneous Communication to Applicant
10-02-2001	Miscellaneous Communication to Applicant - No Action Count
10-04-2001	Workflow - Complete WF Records for Drawings
11-28-2001	Application Is Considered Ready for Issue
11-29-2001	Issue Notification Mailed
12-18-2001	Recordation of Patent Grant Mailed
12-18-2001	Patent Issue Date Used in PTA Calculation

JC557 U.S. PTO

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CONTENTS

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	Date received (Incl. C. of M.) or Date Mailed		Date received (Incl. C. of M.) or Date Mailed
1. Application <u>60</u> papers.		42.	
2. LTR RE-DEC	6-12-98	43.	
3. Del. Surcharge	8-12-98	44.	
4. Prior Art	11-02-98	45.	
10-20 5. Req 3 mos	10-26-99	46.	
6. EDS	1-8-00	47.	
7. Amtd A	13/00	48.	
4-2 8. Formal Req 3 mos	4/4/00	49.	
9. PDA	8-7-00	50.	
10. Str of accept	8-11-00	51.	
11. Hotline cpa 1.53(d)	8-10-00 m 8/3	52.	
12. Pre amdt B	8-10-00	53.	
13. Declaration	8-10-00	54.	
9/14 14. Req 3 mos	9-7-00	55.	
15. EDS in progress	9/8/00	56.	
16. DS	9-14-00	57.	
17. Request Reexam	2-8-01	58.	
18. Request Reexam	2-8-01	59.	
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4-20 20. Notice Allowability	4/24/01	61.	
21. New Drawings	7-25-01	62.	
22. EDS printed	7-20-01	63.	
10-2 23. Letters	10-2-01	64.	
24. Formal Drawings (<u>32</u> sheets) set	11/25/01	65.	
25.		66.	
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QC #2

ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	<i>me</i>	70803	3-12
O.I.P.E. CLASSIFIER		59	3-16
FORMALITY REVIEW	<i>Dg</i>	06485	5-18-98

INDEX OF CLAIMS

✓ Rejected N Non-elected
 - - - - - Allowed I Interference
 (Through numeral) Canceled A Appeal
 + Restricted O Objected

Claim	Date
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If more than 150 claims or 10 actions
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SEARCHED	SEARCH NOTES (INCLUDING SEARCH STRATEGY)
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Class	Sub.	Date	Exmr.	
711	104	10/22/99	 UR	BRS Text Search 10/22/99 UK
	105			
	154			
	165			
	170			
365	173			STN Text Search 3/30/00 UK
	52			STN Text Search 9/1/00 UK
	200			STN Text Search 4/23/01 UK
	230.03			
711	104	3/24/00	 UK	
	105			
	154			
	165			
	170			
365	173			
	52			
	200			
	230.03			
711	104, 105	9/1/00	 UK	
	154, 165			
	170, 173			
	365			
711	52, 200			
	230.03			
	104, 105			
711	154	4/20/01	 UK	
	165, 170,			
	173			
714	6, 7,			
	710, 711			
365	52, 200			
	230.03			

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
711	104, 105	4/23/01	 UK
	154, 165		
	170, 173		
714	6, 7		
	710, 711		
365	52, 200		
	230.03		

(RIGHT OUTSIDE)

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r#14

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(FILE 'HOME' ENTERED AT 09:25:35 ON 01 SEP 2000)

FILE 'USPATFULL' ENTERED AT 09:25:47 ON 01 SEP 2000

L1 85918 S DEFECTIVE OR BAD
L2 2551 S L1 (3A) (MEMORY OR SDRAM OR RAM OR DRAM)
L3 68 S AGGRAGATE OR AGGRAGATING OR AGGRAGATED
L4 1296490 S COMBINE OR COMBINING OR COMBINED OR COMBINATION
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L6 52081 S GATHER OR GATHERED OR GATHERING
L7 728688 S GROUP OR GROUPING OR GROUPED
L8 361257 S JOIN OR JOINING OR JOINED
L9 585857 S MIX OR MIXED OR MIXING
L10 44240 S MERGE OR MERGING OR MERGED
L11 342574 S LINK OR LINKED OR LINKING
L12 481 S L2 (P) (L3-L11)
L13 9 S L12 (P) ASSEMB?

09/035,739
#8

=> d his

(FILE 'HOME' ENTERED AT 06:24:22 ON 30 MAR 2000)

FILE 'USPATFULL' ENTERED AT 06:24:26 ON 30 MAR 2000
L1 82405 S DEFECTIVE OR BAD
L2 2374 S L1 (3A) (MEMORY OR SDRAM OR RAM OR DRAM)
L3 66 S AGGRAGATE OR AGGRAGATING OR AGGRAGATED
L4 1258405 S COMBINE OR COMBINING OR COMBINED OR COMBINATION
L5 364081 S COLLECT OR COLLECTING OR COLLECTED OR COLLECTION
L6 50000 S GATHER OR GATHERED OR GATHERING
L7 705590 S GROUP OR GROUPING OR GROUPED
L8 351732 S JOIN OR JOINING OR JOINED
L9 569833 S MIX OR MIXED OR MIXING
L10 42685 S MERGE OR MERGING OR MERGED
L11 329684 S LINK OR LINKED OR LINKING
L12 448 S L2 (P) (L3-L11)

09/035739
#20

=> d his

(FILE 'HOME' ENTERED AT 06:10:08 ON 23 APR 2001)

FILE 'USPATFULL' ENTERED AT 06:12:42 ON 23 APR 2001

L1 60761 S DEFECTIVE OR BAS
L2 2442 S L1 (3A) (MEMORY OR SDRAM OR RAM OR DRAM)
L3 68 S AGGRAGATE OR AGGRAGATING OR AGGRAGATED
L4 1356781 S COMBINE OR COMBINING OR COMBINED OR COMBINATION
L5 396034 S COLLECT OR COLLECTING OR COLLECTED OR COLLECTION
L6 55385 S GATHER OR GATHERED OR GATHERING
L7 766329 S GROUP OR GROUPING OR GROUPED
L8 174528 S JOIN OR JOINING OR JOINED
L9 612238 S MIX OR MIXED OR MIXING
L10 46567 S MERGE OR MERGING OR MERGED
L11 363135 S LINK OR LINKED OR LINKING
L12 502 S L2 (P) (L3-L11)
L13 9 S L12 (P) ASSEMB?

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USPT	defective or bad	78734	L1
USPT	11 near3 (memory or sdram or ram or dram)	2506	L2
USPT	aggragate or aggragating or aggragated	79	L3
USPT	combine or combining or combined or combination	1262643	L4
USPT	collect or collecting or collected or collection	360971	L5
USPT	gather or gathered or gathering	50446	L6
USPT	group or grouping or grouped	752688	L7
USPT	join or joining or joined	356043	L8
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USPT	link or linked or linking	340187	L12

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11 and sdram	1

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Refine Search: 11 and sdram

Search History

<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT	partial\$.ti. and (good.ti. or defective.ti.)	16	<u>L1</u>
USPT	11 and sdram	1	<u>L2</u>



US006332183B1

(12) **United States Patent**
Weber et al.

(10) **Patent No.:** **US 6,332,183 B1**
(45) **Date of Patent:** ***Dec. 18, 2001**

(54) **METHOD FOR RECOVERY OF USEFUL AREAS OF PARTIALLY DEFECTIVE SYNCHRONOUS MEMORY COMPONENTS**

(75) **Inventors:** **Richard Weber, Boise; Corey Larsen, Marsing, both of ID (US)**

(73) **Assignee:** **Micron Technology, Inc., Boise, ID (US)**

(*) **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **09/035,739**

(22) **Filed:** **Mar. 5, 1998**

(51) **Int. Cl.:** **G06F 12/02; G06F 11/00**

(52) **U.S. Cl.:** **711/170; 711/154**

(58) **Field of Search:** 711/104, 105, 711/154, 165, 170, 173; 365/52, 200, 230.03; 714/6, 7, 710, 711

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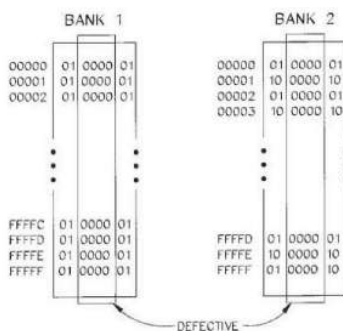
Primary Examiner—Kevin L. Ellis

(74) *Attorney, Agent, or Firm*—Knobbe, Martens, Olson & Bear, LLP

(57) **ABSTRACT**

Memory module using partially defective synchronous memory devices, such as SDRAM components. Multiple partially defective SDRAM components are configured to provide a reliable and nondefective memory module that takes advantage of the manner in which defective cells are localized on each SDRAM component.

12 Claims, 32 Drawing Sheets



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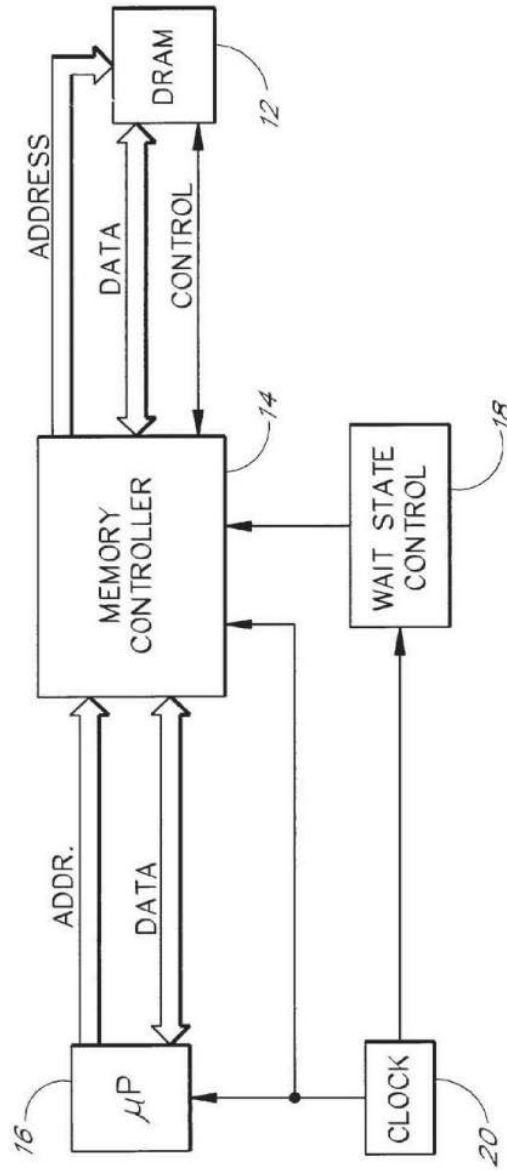


FIG. 1
(PRIOR ART)

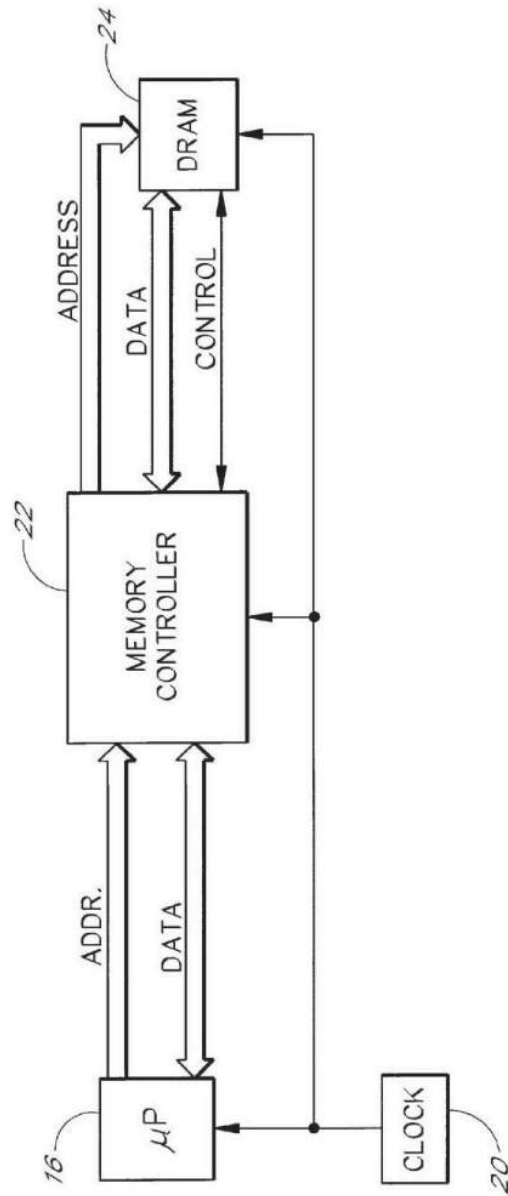


FIG. 2

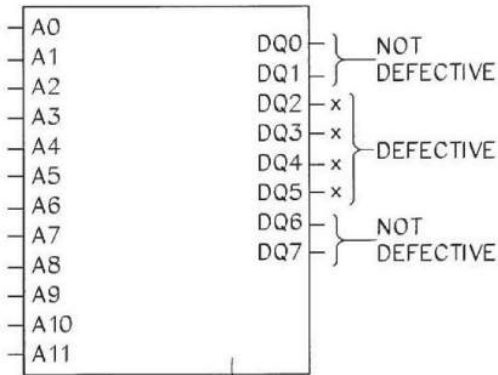


FIG. 3

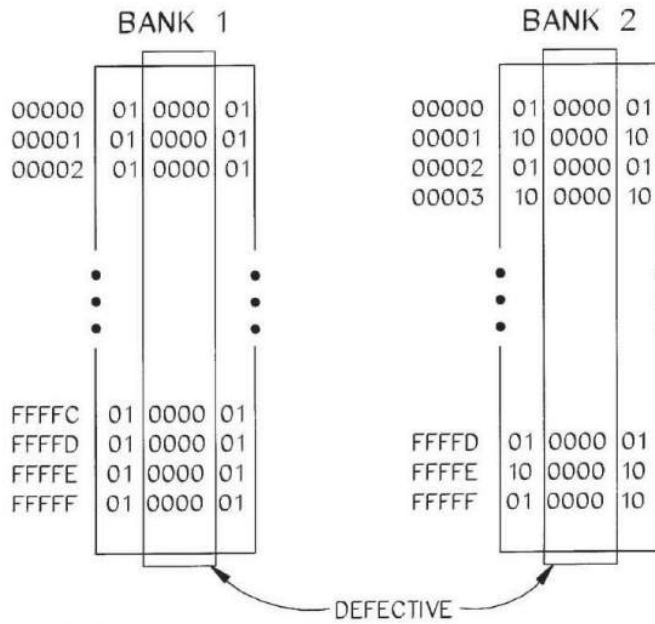


FIG. 4

<i>FIG. 5A</i>	<i>FIG. 5B</i>	<i>FIG. 5C</i>
<i>FIG. 5D</i>	<i>FIG. 5E</i>	<i>FIG. 5F</i>

FIG. 5

FIG. 5A

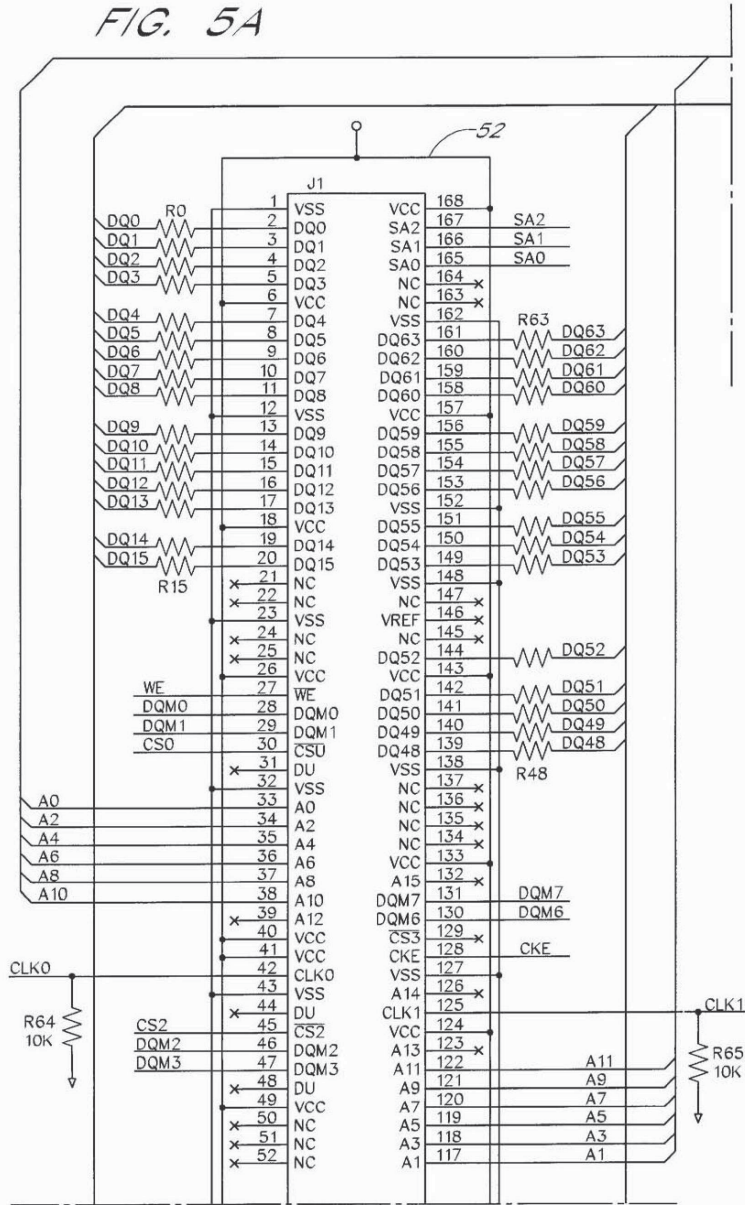


FIG. 5B

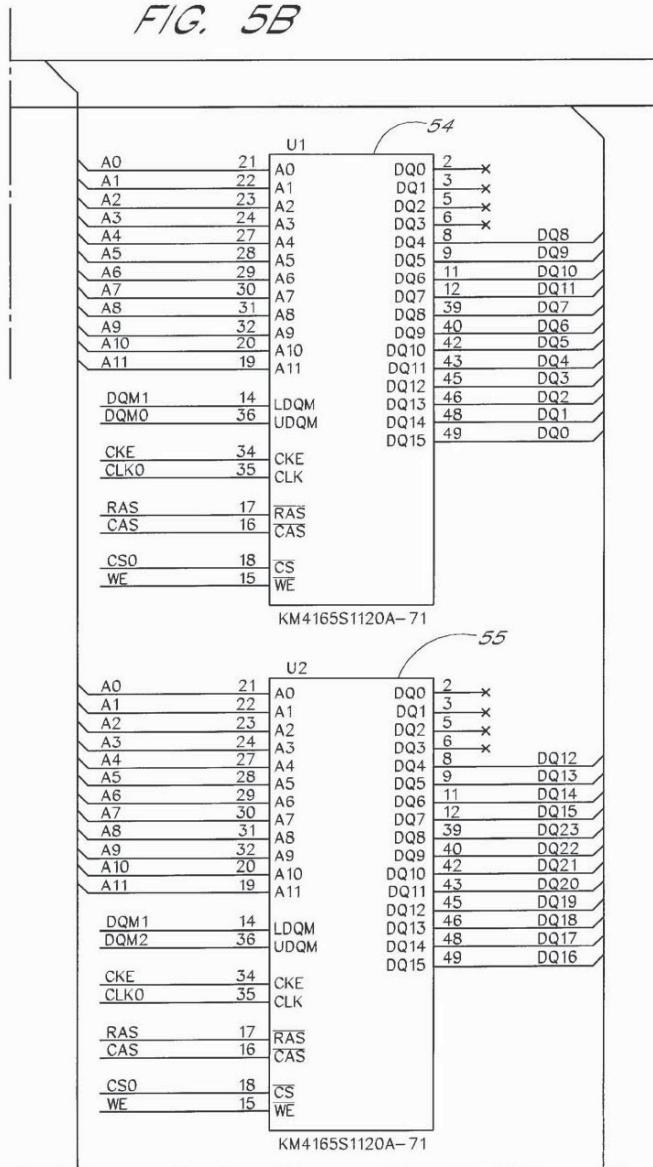
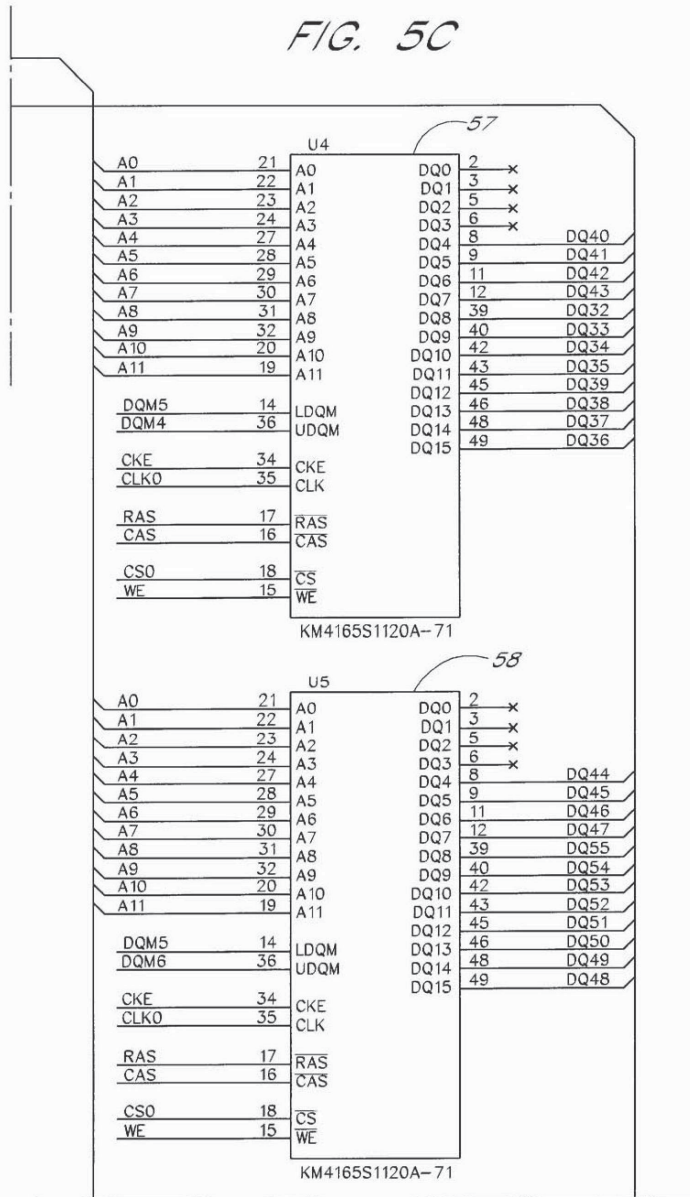


FIG. 5C



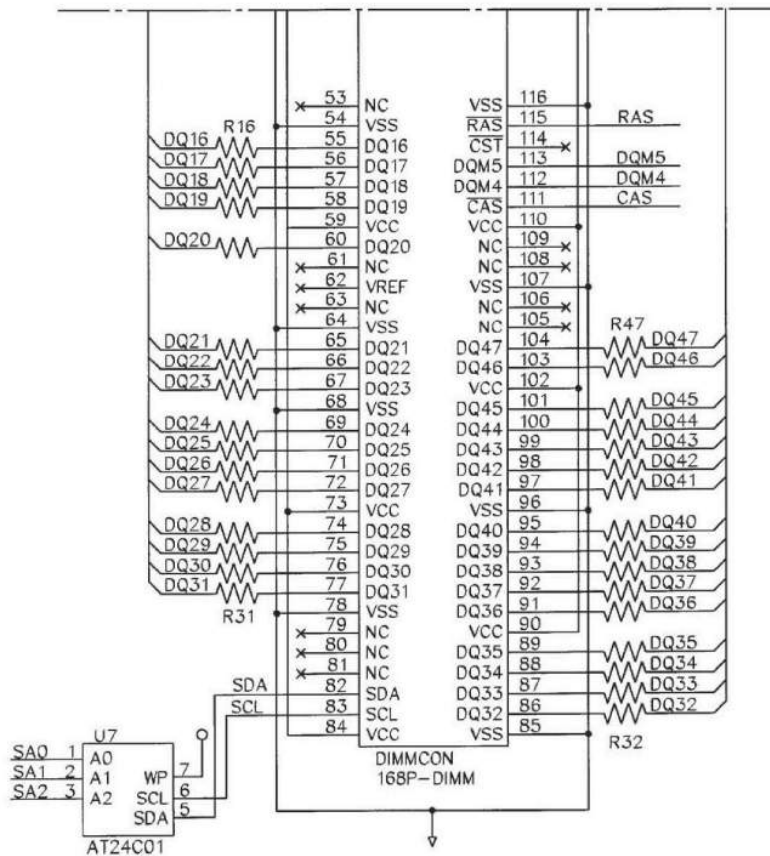


FIG. 5D

<i>FIG. 6A</i>	<i>FIG. 6B</i>	<i>FIG. 6C</i>	<i>FIG. 6D</i>	<i>FIG. 6E</i>
<i>FIG. 6F</i>	<i>FIG. 6G</i>	<i>FIG. 6H</i>	<i>FIG. 6I</i>	<i>FIG. 6J</i>

FIG. 6

FIG. 6A

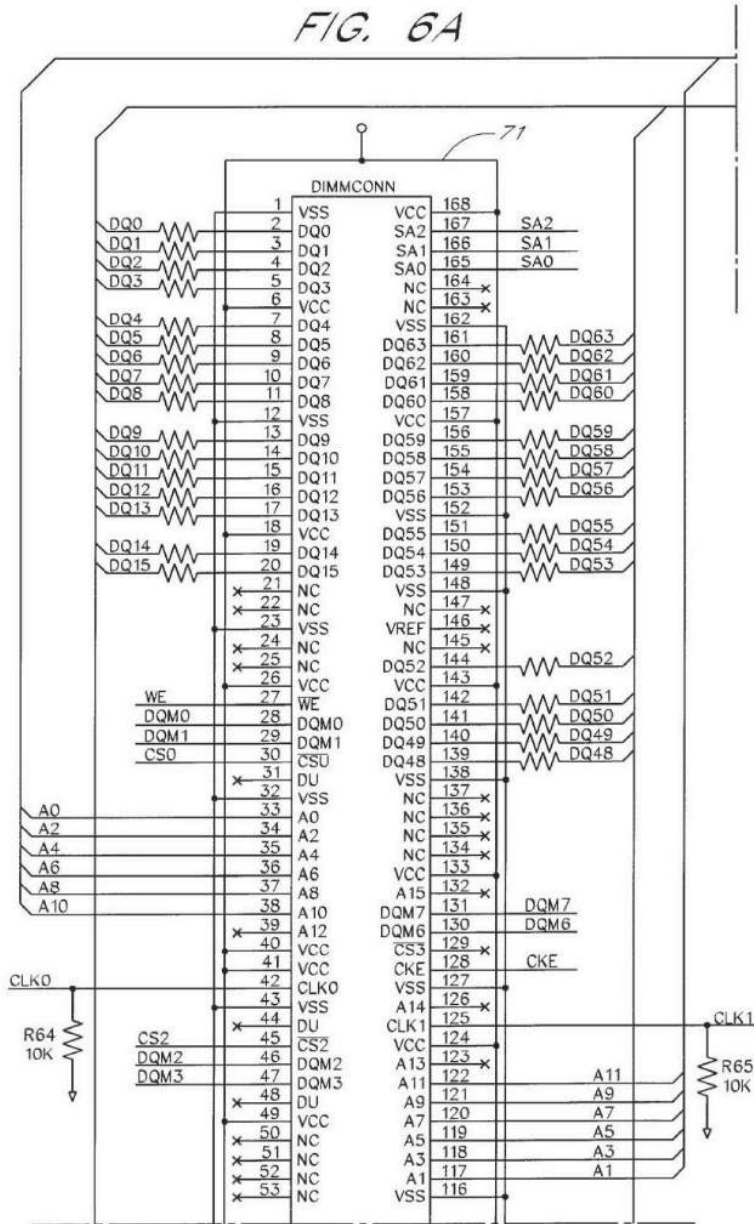


FIG. 6B

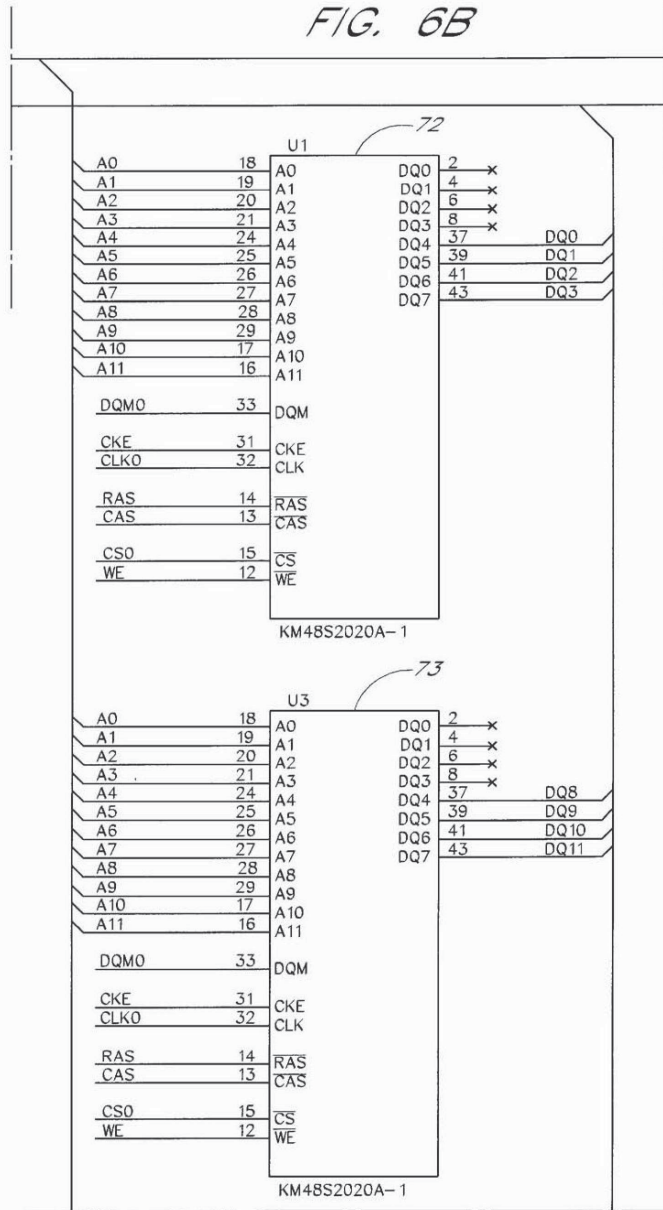


FIG. 6C

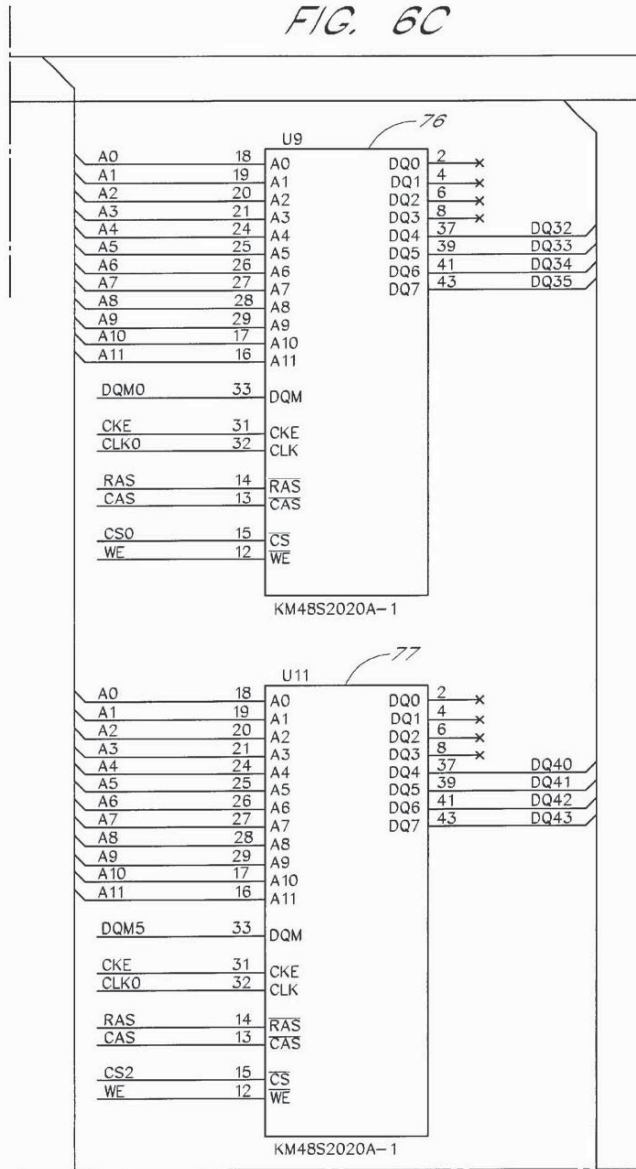


FIG. 6D

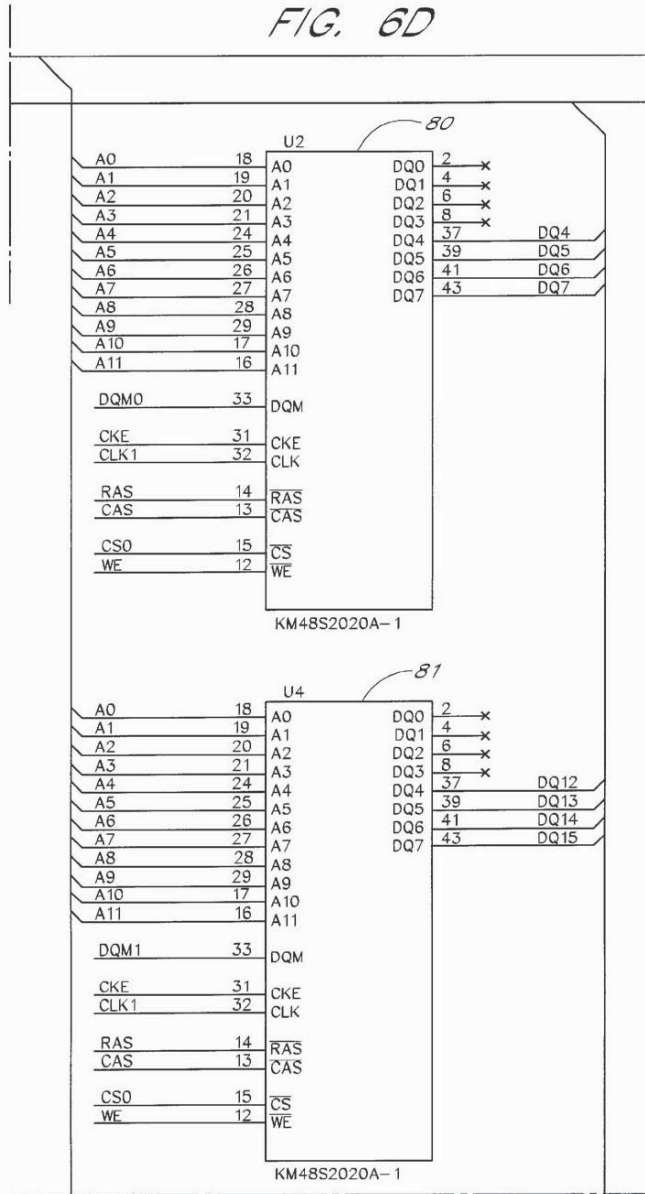
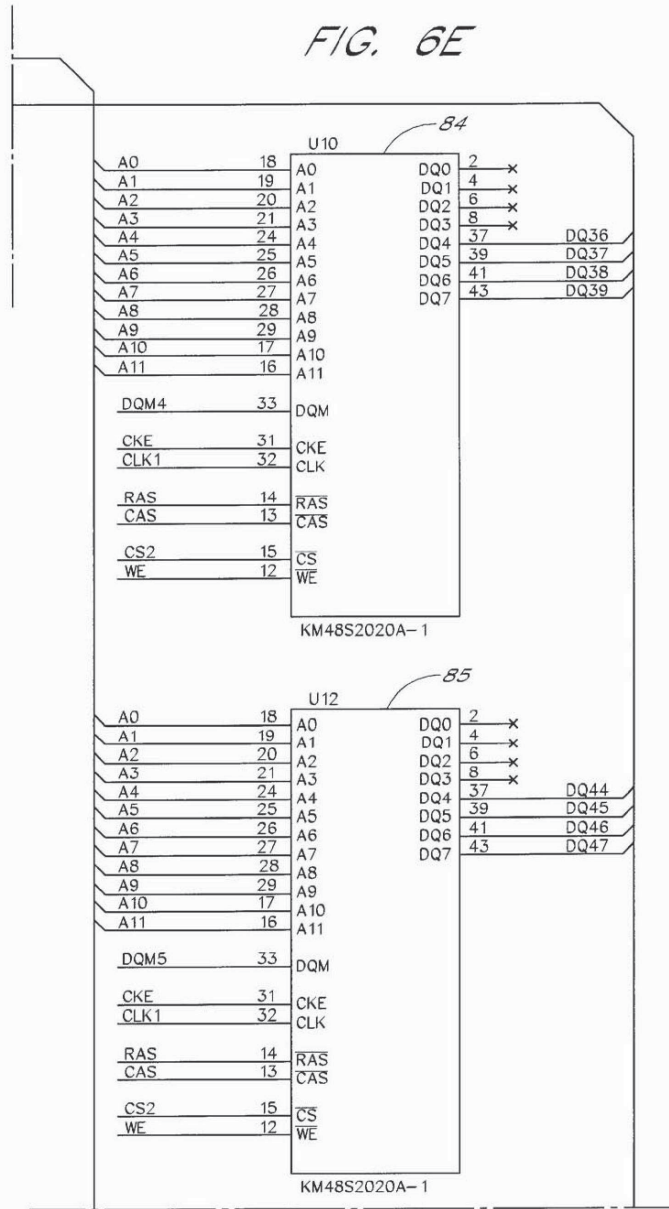


FIG. 6E



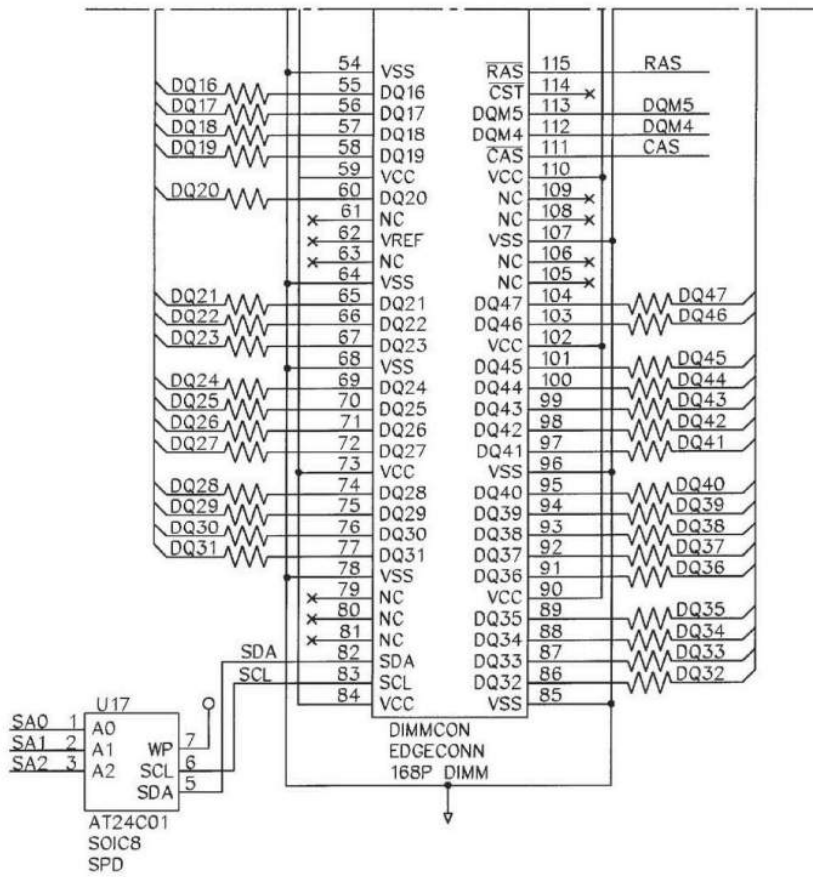


FIG. 6F

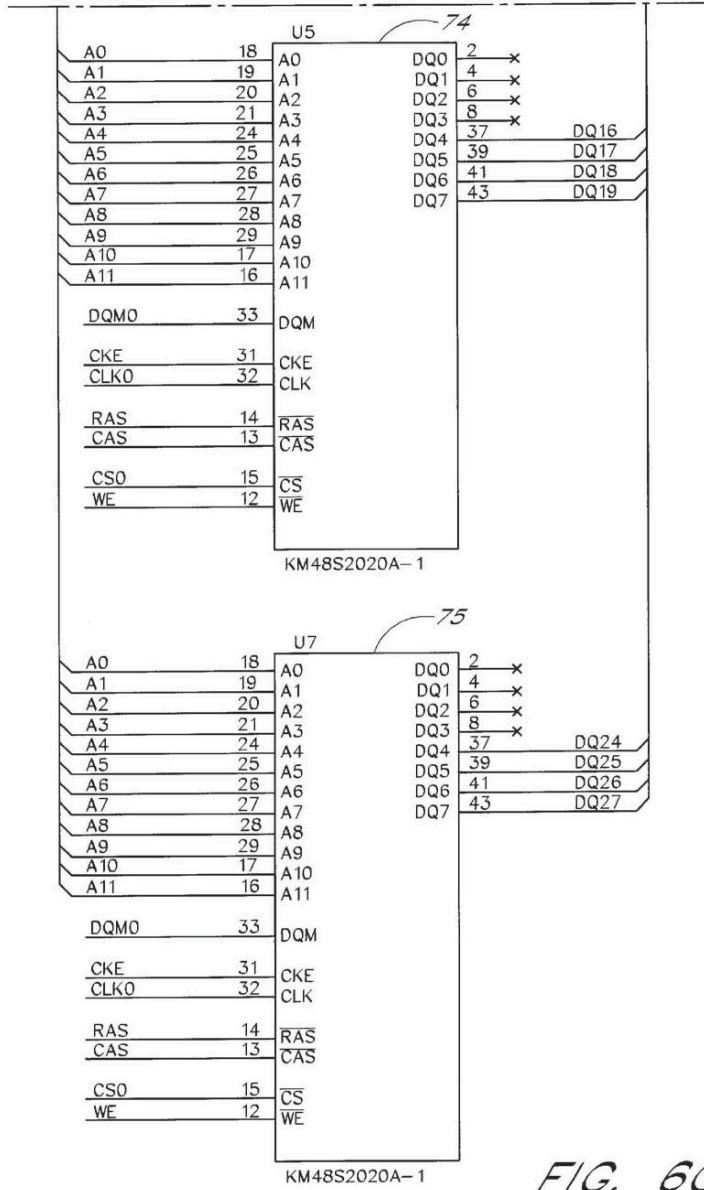


FIG. 6G

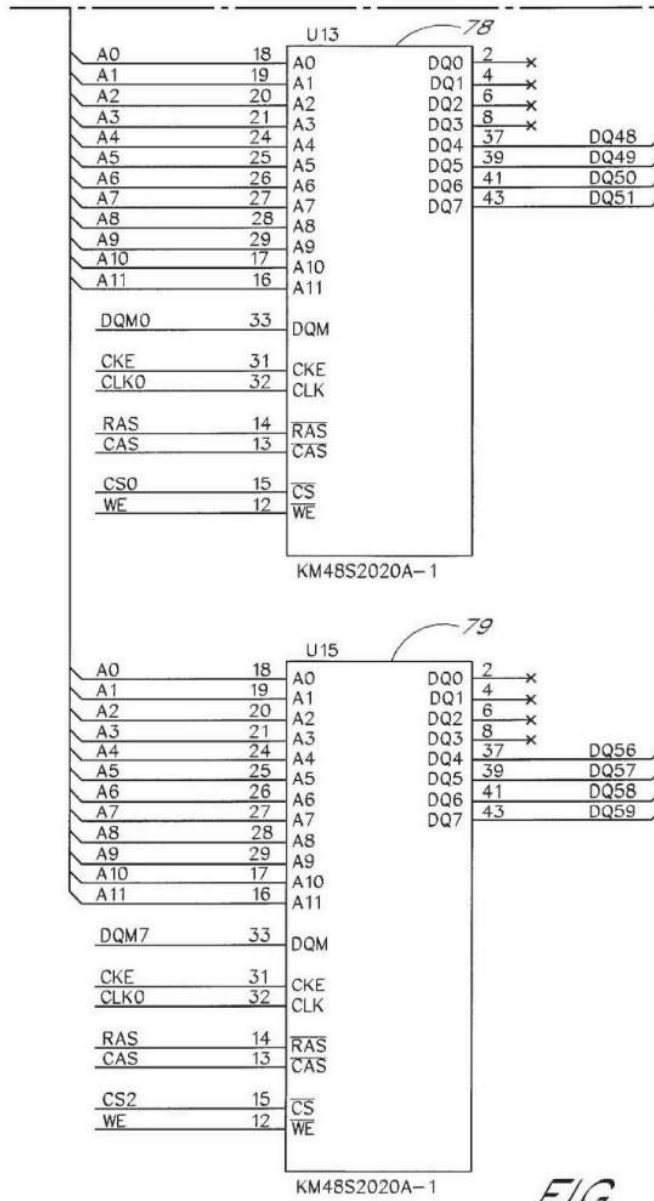


FIG. 6H

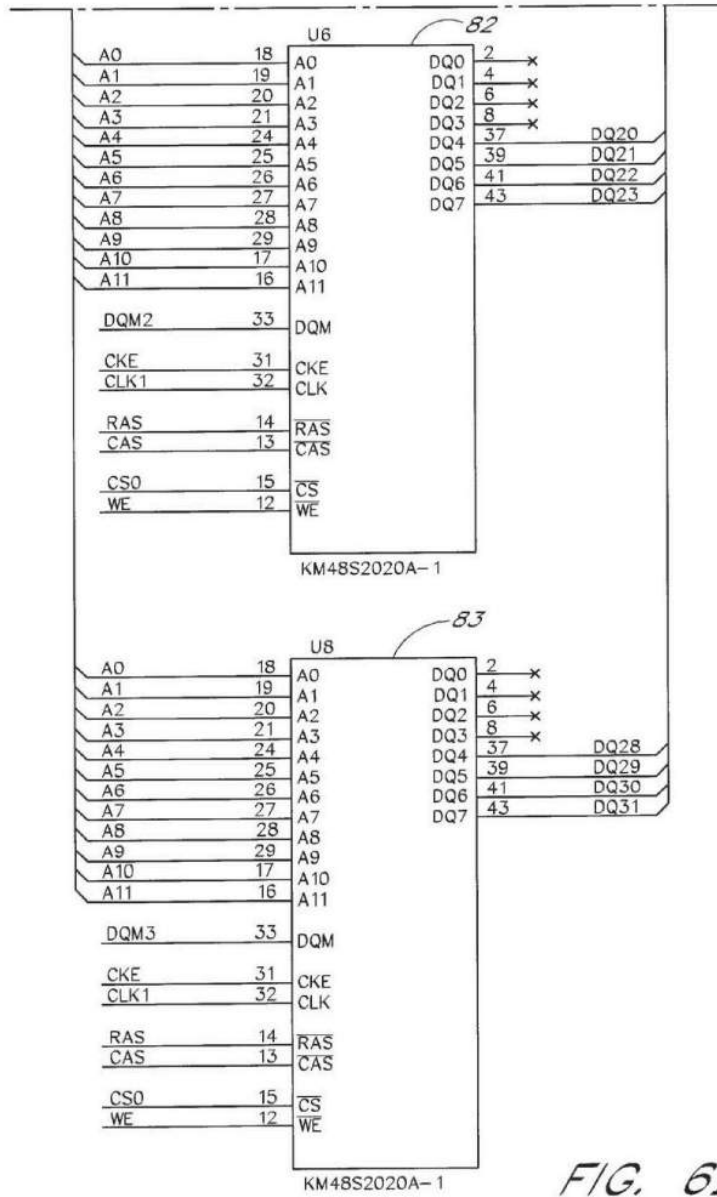


FIG. 6I

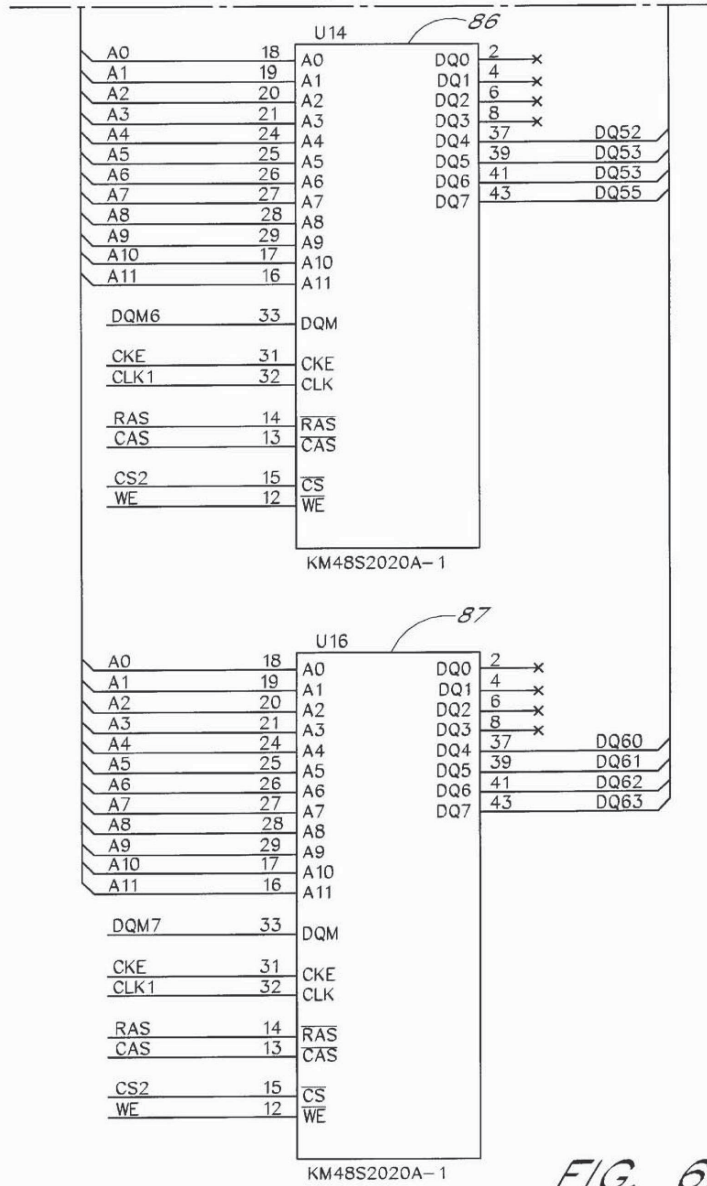


FIG. 6J

<i>FIG. 7A</i>	<i>FIG. 7B</i>	<i>FIG. 7C</i>	<i>FIG. 7D</i>	<i>FIG. 7E</i>
<i>FIG. 7F</i>	<i>FIG. 7G</i>	<i>FIG. 7H</i>	<i>FIG. 7I</i>	<i>FIG. 7J</i>

FIG. 7

FIG. 7A

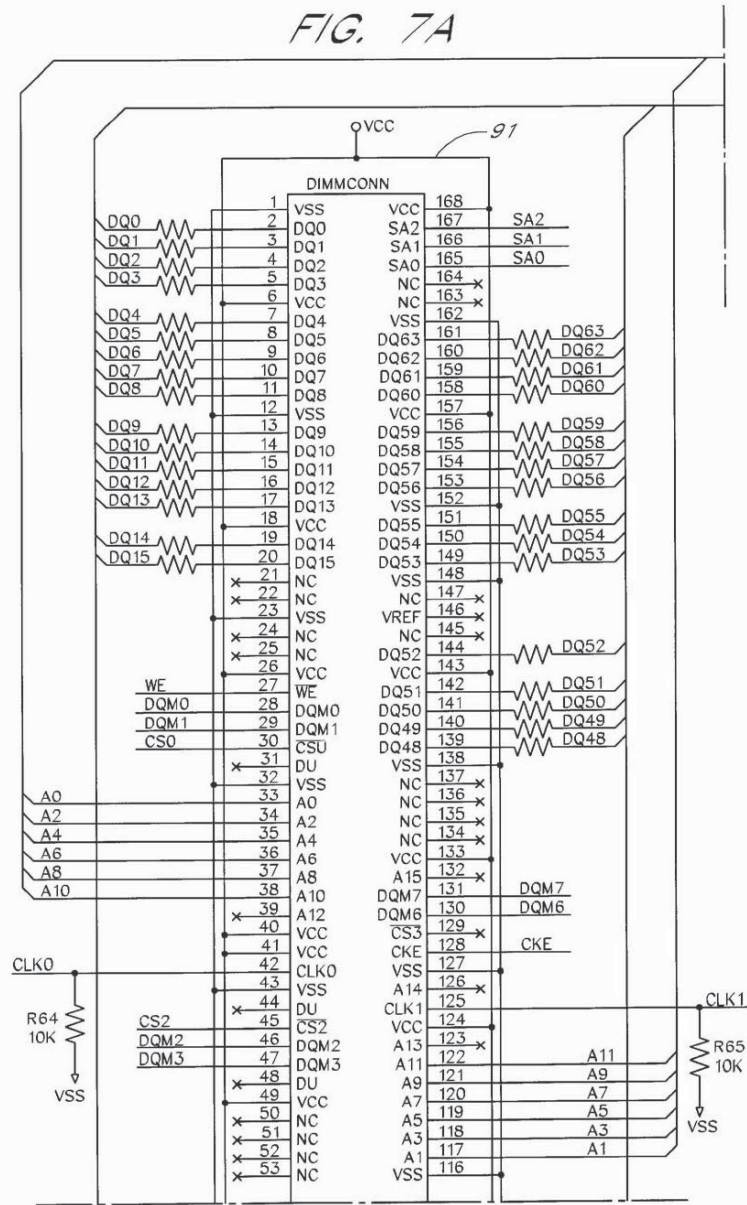


FIG. 7B

